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A STUDY OF THE FEASIBILITY AND APPLICABILITY OF SHAPE CONTROLLED SPACE BASED INFLATABLE MEMBRANE STRUCTURES

by

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September 2000

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13. ABSTRACT Inflatable structures used for space applications offer mass, volume, and cost savings to spacecraft programs, allowing larger space structures to be built. For certain space applications, there are advantages to using large structures. For example, antennas achieve higher gains when they are increased in size. Higher gains equate to higher data throughputs. Therefore, inflatable structures offer improvements in performance to certain types of spacecraft components.

Environmental factors induce surface errors on large inflatable structures, though. This degrades performance, especially for inflatable antennas. To reduce this degradation, active and passive control systems can be used to sense errors and control the shape of the antenna. One method of applying an active and passive control system is by using piezoelectric films that are either attached to or are part of the inflatable structure.

The research performed for this thesis explored the theoretical performance of a large inflatable space-based antenna via spreadsheet analysis and the physical performance of a piezoelectric film via laboratory experimentation. For the laboratory experiment, the film was attached to a drum and varying internal pressures and voltages were applied. Also, in order to validate the experimental results, an analytical model was created using MSC/PATRAN and MSC/NASTRAN software.

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A STUDY OF THE FEASIBILITY AND APPLICABILITY OF SHAPE CONTROLLED SPACE BASED INFLATABLE MEMBRANE STRUCTURES

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ABSTRACT

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I. INTRODUCTION

Inflatable structures are becoming the structures of choice for use in large, space-based structures. Inflatables have a long history of development, but not until recently have they received much attention. They offer many advantages that traditional structural materials (metals, for example) do not. One of their major drawbacks, though, is the fact that they are not as rigid as traditional structural materials.

To help maintain an inflatable structures shape, a control system could be developed to sense and correct these shape errors. Piezoelectric films (thin, flexible materials that change shape when an electric field is applied or create an electric field when their shape changes) are potential control devices that can be used to sense and correct shape errors. If this can be accomplished then the uses of large, inflatable structures can be implemented.

One potential use for inflatable structures in space is as antennas. Large antennas could be included on communications satellites without increasing the cost or mass of the satellite if inflatables are used, and data throughput could be greatly increased. The Department of Defense, for one, should be interested in such a technology advance. Therefore, this thesis intends to demonstrate that this technology can be realistically applied and that it offers great advantages to those who use it.

A look into the use of inflatables as antennas will begin this thesis followed by an examination of the improvements this technology can provide a communications system. Then, a discussion of the history, advantages, funding, and current work being done on inflatables will be presented. After this, the experimental portion of this thesis will be

discussed. A description of a piezoelectric film experiment's set-up and results will be described and presented, and then the efforts made to establish an analytical model will be provided. Finally, conclusions will be drawn.

This thesis intends to show the advantages of using inflatable technology for Department of Defense uses and to demonstrate the potential for using piezoelectric films as part of a shape control system.

II. APPLICATION OF INFLATABLE TECHNOLOGY

A. USE OF INFLATABLE TECHNOLOGY FOR ANTENNA DEVELOPMENT

Antennas in space are a necessity for communications systems utilizing satellites. Today, there are a number of applications for large aperture space-based antennas. Some of these are Very Long Baseline Interferometry (VLBI), mobile communications, earth observation radiometry, active microwave sensing, and space-based radar (Freeland and Bilyeu, p. 1-2). However, placing large antennas in orbit is not easy or cheap. To make large space-borne antennas practical and affordable, inflatable, thin walled structures are being developed. Inflatable structures offer many advantages over traditional metallic, rigid structures. These will be covered later in this work, but now a look at what types of structures are being considered for manufacture and those that have been manufactured will introduce the reader to this new and growing field. To accomplish this, two programs, the Advanced Radio Interferometry between Space and Earth (ARISE) and the Inflatable Antenna Experiment (IAE) programs will be examined. However, these two programs use the same basic structure and antenna type. Before beginning an in-depth look at ARISE and IAE, a look at some other alternative antenna types is appropriate.

Research for this thesis has produced three different types of potential inflatable, space-based antennas. They are an inflatable phased array antenna, an inflatable parabolic reflector antenna with phased array feeds, and a similar parabolic reflector antenna. The latter two will be addressed together. The shapes needed to attain these

types of antennas are achieved using inflation pressure and manufactured gores that when attached together and inflated produce a desired shape. Inflatable phased array antennas (without a reflector) have been proposed as a viable solution for making large space-based antennas with apertures up to fifty-five meters in diameter. This inflatable antenna would offer all of the advantages of conventional phased arrays (multiple, steerable beams, for example), but it would not retain the desirable traits of a continually inflated space structure because it would have to be rigidized.

> Once in space, the antenna would be inflated and rigidized. The rigidization would take place by constructing the antenna using materials that solidify over a matter of hours when exposed to either the ultra-violet light or some other material solidification method. This would prevent distortion of the antenna in space when the gas used for inflation dissipates (Kunath and Sharp, 1991, p. 2).

The problem with using rigidization for the whole structure is that the inflatables lose the traits of ruggedness and damped dynamics, which are inherent in inflatables that are not rigidized (Palisoc et al, 1998, p. 748). This type of rigidized inflatable antenna would also become very complex with increasing size (Kunath and Sharp, 1991, p. 1). Therefore, the parabolic-shaped inflatable antennas offer a more attainable configuration in the short term, and consequently, more work has gone into their development.

Parabolic inflatable antennas that are being produced today include a lenticular structure with a torus and struts for support. The torus and struts are rigidized after inflation in orbit, and the lenticular structure is kept inflated with gas for the life of the satellite. The lenticular structure consists of a reflective parabolic surface and a symmetrical, radio frequency transparent canopy. The two parabolic surfaces are joined

together at the torus, which encircles the lenticular structure at the joining of the parabolic surfaces and attaches itself to the lenticular structure by means of adjustable ties. The struts then connect the antenna to the rest of the spacecraft (Cassapakis and Thomas, p. 5). Microstrip array feeds can be placed in the antenna structure so that multiple beams are available for use (Hoferer, 1998, p. 1452-1453), or the antenna can be configured for just one beam. The basic antenna structure is the same for either configuration. Figure 1 shows an artist's conception of such an antenna. This picture was found on the L'Garde, inc. webpage (www.lgarde.com).

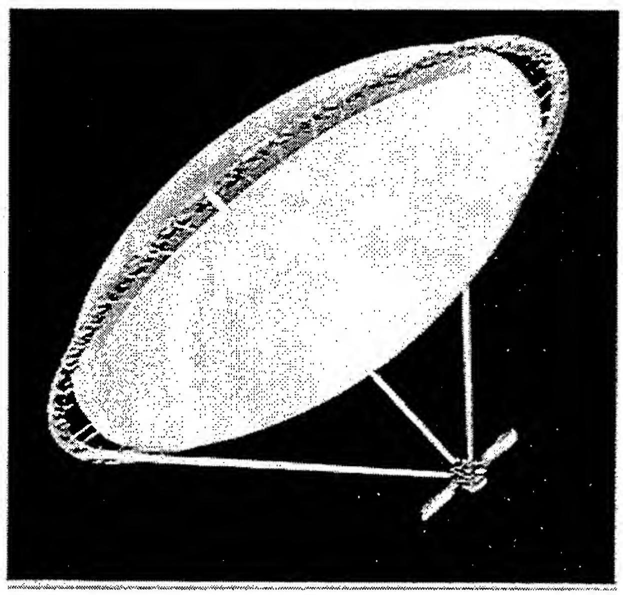

Figure 1. Artist's Conception of an Inflatable Parabolic Antenna.

There are two major hurdles for this type of antenna to overcome: meteroids ripping holes in the surface of the structure and surface errors.

Assuming that the inflatable antenna can be deployed properly and attain its desired shape, which IAE showed was possible, the antenna must maintain its desired shape for the remainder of its design life. There are many reasons why inflatable

antennas would lose their desired shape, and this topic is addressed in a later chapter. However, one major possibility of shape loss would come from deflation. Meteroids could tear holes in the antenna, and the gas used to inflate the antenna could escape. Replacement gas is therefore needed to maintain the shape of the antenna and to keep it inflated. Analysis of the meteroid environment has led to the conclusion that inflated systems could remain operational for ten or more years. This is due to the low pressures needed to maintain the shape of the antenna and the low weight of the gas system (Palisoc et al, 1998, p. 748). The low pressures required stems from the fact that these antennas will be in a zero gravity environment in which a small internal pressure is sufficient to provide stiffness and shape (Criswell et al, p. 1046). In fact, it is estimated that a 10-meter inflated antenna system with a ten year design life would have a mass of only 145 lbm and a 30-meter inflated antenna system with a ten-year design life would have a mass of only 190 lbm (Thomas and Friese, p. 66). These values are lower by hundreds of pounds (mass) than deployable antennas made from metals of comparable size. So, having a realistic ability to maintain inflation over the design life, only surface errors remain to be resolved.

Surface errors in the antenna reflector surface can come from a number of sources, and there are a number of ways to correct these errors. All of this is covered in a later chapter, but the precision that a reflector surface needs to have to be an effective antenna should be addressed now. Good antenna performance requires that the rms (root mean square) surface accuracy of the antenna be between sixteen and twenty times better than the wavelength (λ) being used (Ulvestad, Linfield, and Smith, p. 5). For frequencies of 6.32 GHz ($\lambda = 47.5$ mm) and 8.4 GHz ($\lambda = 35.7$ mm), the rms surface errors would

have to be kept to 2.4 mm and 1.8 mm, respectively. As an example, a 10-meter diameter antenna with a 0.77 mm rms error would have a gain of 79% of its theoretical maximum at 15 GHz which corresponds to a 20 mm wavelength (Thomas and Friese, p. 1). In later analysis, a 1 mm surface rms error is assumed, and the gain of antennas using different frequencies is calculated taking this error into account using the Ruze equation (Cassapakis, Love, and Palisoc, 1998, p. 456).

Also of concern for these large structures is atmospheric drag. If, however, these structures are placed above 750 km, there is no significant atmospheric drag (Cassapakis, 1999, p. 5). Having discussed this type of antenna in general terms, it is now appropriate to examine one use of this structure and one planned use of this structure.

The IAE was a NASA project launched from the space shuttle Endeavour as part of mission STS-77 on May 20, 1996. It was deployed in a Low Earth Orbit via a Spartan 207 retrievable satellite and remained operational for ninety minutes until jettisoned (NASA, p. 2). The reflector itself was fourteen meters in diameter, had twenty-nine meter struts, and weighed less than 200 lbs (Acree, p. 4). The design goal of the IAE was to achieve a surface precision of 1 mm root mean square error while on orbit (Freeland, p. 4). This was almost achieved, but a root mean square error of a few millimeters resulted (Freeland et al, p. 6). Still, even though no actuation system was used, the IAE could be used with frequencies around 5 GHz. This reaches into the C-band of the RF spectrum, and it could be used for mobile communications. Also, the stowage size of this antenna was roughly the size of an office desk (Freeland et al, p. 6). This experiment, the first of its kind, showed that inflatable reflectors in space are achievable, and its performance is helping the development of inflatable structures for future use.

The ARISE program is under development, but it is planned to be a Very Long Baseline Interferometry mission that will consist of at least one 25-meter diameter radio telescope that will have basically the same structure as IAE and other lenticular inflatable antennas. It will be placed in a Highly Elliptical Orbit (HEO), and the spacecraft will have a mass of approximately 1700 kg. The expected launch date is in 2008 (Chmielewski and Ulvestad, p. 2). ARISE will observe frequencies up to 86 GHz, meaning that the root mean square surface error needs to be approximately 0.175 mm. In 1999, L'Garde built a 7-meter inflatable antenna that had a 1.7 mm rms error, but it predicts that it can reduce that to 1 mm for a 25-meter reflector with appropriate development effort (Chmielewski, p. 5). More work and development is needed to make ARISE a reality. A later chapter will address the current work and funding for this technology, and another chapter will address a potential actuation method for surface accuracy maintenance. IAE and ARISE are both helping the development of inflatable structures and especially inflatable antennas. Because of the continuing maturation of this technology, the Department of Defense can benefit greatly from inflatable structures in space.

The next chapter will explore how inflatable antennas can improve data rates for space-based communications systems. A mobile, disadvantaged user (low power, small antenna) can receive extremely high volumes of data quickly if large inflatable antennas are used in space. There is one major drawback to using them (reduced footprint size), but the enhanced communications capabilities to the military are immense. With continuing research, an extremely viable group of materials for communications systems antenna design will be available.

B. APPLYING INFLATABLE TECHNOLOGY TO SPACE-BORNE COMMUNICATIONS SYSTEMS

Inflatable antennas offer many advantages to a satellite system. They are lightweight structures, can be stowed compactly, and are relatively cheap. Conventional antenna structures cannot compete with inflatable structures in these categories. Inflatable structures now make it feasible to put larger antennas in space. Larger antennas offer many advantages to ground users, especially mobile, disadvantaged users. The link can be closed for many more users, and the data rate throughputs that they can receive is excellent. To confirm these conclusions, a few link budget models were created and evaluated.

Using Excel, six different models were created. Two were Intelsat VII link budgets, and four were the Defense Satellite Communications System (DSCS) III Service Life Enhancement Program (SLEP) link budgets. These two satellite systems were selected because the military uses them for communications. One is commercially owned (Intelsat VII) and the other is a Department of Defense asset (DSCS III). Since most of the specifications for these two satellite systems and their operations were available in open literature, the link budgets have some real use numbers in them. Values for certain operational parameters (e.g., bandwidth and power for specific operational scenarios) are not available, so these were handled parametrically or nominal values were employed. Meaningful comparisons and conclusions can still be reached by this analysis. The environment used for this analysis is benign. No jamming or multiple user

considerations were modeled. Other constraints had to be applied to make the link budget analysis possible.

For the Intelsat VII link budgets, Intelsat 702 was selected, and for the DSCS III link budgets, the SLEP program was selected. Using Communications Satellites 1958-1995 produced by The Aerospace Corporation and a series of briefs produced by the U.S. Naval Space Command, bandwidths, frequencies, and antennas, for example, were extracted and entered into the models. These models can be seen in Appendix B, and to keep this chapter succinct, they can be referenced for exact data used in this analysis. The gray box entries are values entered into the model, and the rest of the boxes are solved for using equations that can be found in Appendix A. Of note, the edge of the ground footprint of the satellite system, not the center, was used in the analysis. This shows the robustness of the analysis. The Intelsat 702 spot beam and the DSCS III SLEP Channel 3 were used in the model. Also, the ship and ground antennas used for this analysis are not easily extracted from the models. For the Intelsat 702 models, the Navy Commercial Wideband SATCOM Shipboard antenna (2.7 meters) and the AN/FSC-78(V) (18.29 meters – ground antenna) were used. For DSCS III SLEP, the AN/WSC-6(V)5 (2.36 meters) was used for the shipboard antenna, and the AN/FSC-78(V) was used again for the ground antenna. The AN/WSC-6(V)5 is listed as a seven-foot antenna, but, according to Ray Gajan of the U.S. Naval Space Command, the diameter of the antenna is actually seven and three quarters feet in diameter (2.36 meters). For the disadvantaged user models using the DSCS III SLEP satellite system, the ground antenna used was the AN/FSC-78(V), and the disadvantaged user antenna was selected to be 0.25

meters (9.85 inches). With these assumptions presented, it is now appropriate to elaborate on the inflatable antenna aspect of the models.

For the inflatable antenna, two model parameters were varied. The diameter of the antenna was increased in 5-meter increments from that of the existing Intelsat 702 and DSCS III SLEP antennas to a maximum of forty meters. The second parameter was the rms surface deviation from ideal. Assuming that an rms surface error of one millimeter can be achieved on an inflatable antenna in space by use of some sort of actuation system, a degraded antenna gain was calculated for each antenna diameter. Of note, the space antenna for Intelsat 702 (existing on satellite now) and the inflatable antennas that replaced it in the analysis were both the transmitting and receiving antenna. For DSCS III SLEP equipment (existing on satellite now), a separate receive multi-beam antenna was used in the analysis since it has receive and transmit multi-beam antennas for channel 3. The inflatable antennas used to replace the existing DSCS III SLEP antennas in the analysis were used for both transmitting and receiving. The main advantages of using a larger antenna are that a weaker signal can be sensed at the satellite and more signal power can be received at the ground antenna. This is due to the increased gain of the antenna, due to its size. The result is more data throughput, since most disadvantaged users (ship or mobile) are not throughput-limited by the amount of bandwidth they are using but by the amount of received power. A major drawback to using larger space-borne antennas to improve link performance is that the ground footprint is diminished, so that only users in a smaller geographical area on the earth can access the space-borne antenna. With this in mind, an evaluation of the performance of the inflated antennas is in order.

Three relations are used to calculate throughput (i.e., information bit rate) for a space-based antenna system. One uses the received signal power C and required Eb/No in order to calculate throughput. Another relation uses channel bandwidth and received signal to noise power ratio (Shannon's limit) to calculate throughput. The third uses bandwidth, signal modulation, and a waveform shaping or roll-off factor to calculate throughput. All of these relationships can be referenced in Appendix A. These three throughput relationships help in analyzing the effectiveness of a larger antenna. As will be seen, a large increase in space-borne antenna size will not do much for current ship configurations. However, the future disadvantaged user will benefit immensely from a larger space-borne antenna as will future ship configurations.

Appendix B shows the graphs of the throughputs based on the three relations mentioned earlier and antenna size. When examining these graphs, it is important to note that the maximum data throughput that can be achieved for a given antenna size can be no greater than the lowest throughput indicated by the three curves on the graph. Beginning with the Intelsat 702 and DSCS III SLEP ship-to-ship and shore-to-ship graphs, an examination reveals that they all present a similar picture. If there were no bandwidth limitations, the throughput could be vastly improved by increasing the size of the satellite antenna. However, this is not currently practical. The throughput theoretically could be improved somewhat up to Shannon's channel capacity limit, but the practical achievable throughput is much lower than this limit. Increasing signal power only improves the bit error rate beyond this threshold (Wadsworth). Larger antennas for this application provide little improvement in capability. Only small changes in antenna size make any difference. In fact, the throughput is optimized with a

satellite antenna diameter somewhere between the Intelsat or DSCS III antenna and a five-meter antenna. Of note, the DSCS III SLEP graphs and disadvantaged user graphs all show an antenna diameter of 0.711 meters for the first antenna diameter. This is the transmitting antenna diameter, but both the transmitting and receiving antennas were used in the analysis. Therefore, the graphical representation of these scenarios is not completely accurate, but they give a good approximation of throughput capabilities for the actual DSCS III SLEP antenna used. So, a small change in size maximizes throughput, but inflatable antennas could still be used to reduce weight, save cost, and provide numerous pre-deployment stowage options. However, the disadvantaged user who has a quarter of a meter antenna benefits greatly from larger space antennas.

The disadvantaged user has many limitations. Disadvantaged users are mobile so it is difficult to carry heavy and bulky equipment, and they have little power to transmit signals. With this in mind, two models were set up using the DSCS III SLEP satellite. The two models developed are a disadvantaged user to a disadvantaged user model and a ground to a disadvantaged user model. The maximum transmit power of a disadvantaged user was set at five watts. A soldier on the ground could carry a communications unit that meets these criteria. Appendix B can also be referenced for the disadvantaged user graphs and spreadsheet models. From that data, a disadvantaged user could send data to a disadvantaged user via a forty-meter space borne antenna with a data rate of approximately thirteen Mbps. That value is about eight T-1 lines, and this is not even the practical limit. With a larger space antenna, even more throughput could be achieved. A shore link to a disadvantaged user would provide the full potential throughput with a space antenna somewhere greater than forty meters in diameter. For a forty meter

antenna, the data rate is roughly twenty-seven T-1 lines. So, the throughput capability of a disadvantaged user would be tremendous. However, there is a drawback to using this larger antenna.

The geographical area of a satellite footprint is diminished with increasing satellite antenna size. In fact, frequency and antenna size affect footprint size, but since the frequencies are fixed in these models, only antenna size affects the footprint size. Now, some clarification is in order. The access field of view of a satellite is unchanged regardless of antenna size or frequency. The coverage field of view is what changes. So, a ground site would be in the field of view of what the satellite can see regardless of antenna size or frequency, but it may not be in the field of view of the satellite beam that can send or receive data. This would become a large factor in the disadvantaged user scenario. For example, for both disadvantaged user scenarios, the up-link footprint goes from approximately 1,500,000 square kilometers to 1,000 square kilometers if a forty meter antenna is used. For the down-link, the footprint goes from approximately 20,000,000 square kilometers to 5,000 square kilometers if a forty meter antenna is used. These are large differences. An accurate pointing system would have to be used on the ground and on the satellite. However, this is a small price to pay for such a large improvement in throughput. In fact, 1,000 square kilometers may be a major theater of war, especially in this age of low intensity conflict. The communications link produced by the satellite would be limited to those users in a certain geographical location, but the signal power provided to those users would be substantial, allowing many users to share that signal power and still maintain high data rates. With these advantages, the application of inflatable technology is extremely attractive.

Even though disadvantaged users with small antenna benefit greatly from a larger satellite antenna, it cannot hurt other users from using them as well, as long as accurate pointing schemes and mechanisms were present. A current ship configuration will have its throughput maximized if, for example, a forty meter satellite antenna were used. It would just need to be in the satellite's footprint. With beam pointing from the satellite and accurate tracking and pointing of the ship antenna, this is possible. In fact, ships could use the smaller quarter of a meter antennas. The space on a ship is limited, so any savings in antenna size are attractive. Using inflatable structures makes this concept a possibility. Large antennas will be able to be used in space due to the advantages and savings inflatable structures provide. More research and work is needed, though, to further validate this technology.

C. OPERATIONAL USE OF SPACE INFLATABLE STRUCTURE TECHNOLOGY

Inflatable space structures are a promising technology that has received renewed interest in recent years. These structures are made of thin, flexible materials that can be inflated into a predetermined, manufactured shape. Research and development began on these structures in the 1950's. Goodyear developed technology demonstrations on structures such as an inflatable search radar antenna, a lenticular inflatable paragoric reflector, an inflatable pyramidal horn, and a radar calibration sphere. All of these demonstrations were developed in the late 1950's, but they were not the first flight-tested inflatable structures (Freeland and Helms, 1999, p. 4-7). The first flight-tested inflatable

structures were balloons that were part of NASA's Echo program. Echo was a passive communications relay program, and seven balloons were launched between 1958 and 1964. Over twenty years passed before another inflatable structure was successfully used in space, except for the inflatable re-entry vehicle decoys used beginning in the late 1960's (Katuin, 1999, p. 1). These decoys were used to simulate the radar and IR signatures of re-entry vehicles. Interestingly, though, they were the first flight-tested inflatable structures that were configured in a shape other than a sphere (Freeland and Helms, 1999, p. 9). It wasn't until the mid-1980's until new inflatable structures were flight-tested.

In 1984, NASA unsuccessfully deployed an inflatable calibration target for a Ku-band radar. Then, in 1985, the Soviet Union used two inflatable balloons in its Venus missions, Vega 1 and Vega 2 (Katuin, 1999, p. 1). Over ten years passed before inflatable structures were used again, but there were significant technology demonstrations in the 1980's. For example, the European Space Agency developed a 6-meter inflatable very long baseline interferometry antenna, an inflatable telescope sunshade support structure, and a 10 by 12 meter inflatable land mobile communications reflector antenna. L'Garde, Inc. and the United States Air Force developed an inflatable large offset reflector structure in the late 1980's (Freeland and Helms, 1999, p. 10-13). However, it wasn't until 1996 that another inflatable structure was launched into orbit. On May 20, 1996, NASA launched the Inflatable Antenna Experiment (IAE) from the Space Shuttle Endeavour. The IAE was a 14-meter diameter antenna that was used to test the potential of using inflatable structures as antennas (Katuin, 1999, p. 1). The mission was a success, and there are more inflatable missions on the horizon.

One newly developed inflatable structure is part of a United States Air Force project that will use lasers to track an inflated sphere target. The sphere has a 12-meter diameter with a skin thickness that is thinner than a human hair and is silver in color. L'Garde, Inc. constructed the sphere in four months, and its cost was $500,000. (Robbins, 1999, p. 1). A near future use of this technology is an inflatable solar array that will be part of the DS4/Champollion mission in 2003. This mission will be the first to land on and study the center of a comet (Acree, p. 15). Inflatable technology has a long and mostly successful history, and there is current work being done with this technology as well. In fact, inflatable technology is rapidly developing, and its uses are almost endless.

There are many potential applications for inflatable structures in space. Among these are space suits, habitats, antennas, attenuation systems, reflectors, covers and sun shields, solar arrays, and radars (ILC Dover, 1999, p. 8). Other possible uses are for rovers with inflatable wheels, sail occulters, infrared telescopes, and radiometers (Chmielewski, 1999, p. 17, 21). Science instrument support structures, solar cell support structures, large lightweight trusses, and solar collectors and concentrators are also possible uses (Freeland and Helms, 1999, p. 18). The Department of Defense, NASA, and commercial industry are even working on developing phased array antennas (Katuin, 1999, p. 6). In fact, the Air Force Research Laboratory initiated analytical and experimental evaluation of membrane phased array antennas in fiscal year 1998 (Acree, p. 1). Other types of more conventional structures could be used to try to achieve most of these applications, but there is a reason why there is considerable interest in using

inflatable space structures. Inflatable space structures have distinct advantages over conventional space structures.

Inflatable structures have low system mass, low development and production cost, low packing volume, packing flexibility, reduced system complexity (high reliability), controlled deployment, components that can be rigidized, long life, and design flexibility (many different configurations and shapes are possible) (ILC Dover, 1999, p. 10). These are all advantageous attributes for a space structure to possess, but perhaps the most advantageous attribute, that has not been mentioned yet, is low cost.

Inflatable space structures offer cost savings to a space system. Lower mass and stowed launcher volume may allow a smaller launch vehicle to be used. This will save a space system a considerable amount of money since a large portion of a space system's cost comes from its launch platform. In fact, a stowed inflatable space structure is ten to one hundred times smaller than a stowed mechanically deployed structure, and its mass can be up to ten times smaller than a conventional structure (Acree, p. 6). For example, in 1992 fiscal dollars, if using an inflatable space structure allowed a satellite to be launched in an Atlas G or a Centaur instead of a Titan IV, eighty-two million dollars would be saved in launch costs (Larson and Wertz, 1992, p. 731). Inflatable space structures offer possibilities like this. They are also inherently cheaper than conventional space structures. For example, an operational version of the IAE could be developed for approximately ten million dollars (in 1996), but a conventional space structure with the same capabilities as the IAE may cost as much as two hundred million dollars (Gipson, 1996, p. 1). Overall, inflatable space structures are ten to one hundred times cheaper than conventional structures (Acree, p. 6). It is postulated that in 2003, a UHF to X-band

antenna with millimeter surface accuracy will have a recurring cost of seven million dollars for a 10-meter antenna and ten million dollars for a 25-meter antenna (Acree, p. 4). These cost reductions are attractive, but there are even more advantages and attractive qualities that inflatable space structures offer to space systems.

Inflatable space structures are not susceptible to acoustics and vibrations caused by launches, and they can be deployed without using extravehicular activity. They also have excellent dynamics while in orbit, and they tend to have relatively small surface errors in orbit since gas pressure tends to perfect bodies of revolution (Friese and Thomas, p. 1). Also, inflatable structures "offer better thermal control opportunities than open structures. The radiative exchange between the sides of the inflatable can sharply reduce temperature non-uniformities" (Thomas and Friese, p. 1). Another advantage is the availability of materials and their abilities to be rigidized (inflated and then hardened into a firm shape). Some materials used for producing inflatable structures are polyesters, fluoroplastics, and polymides. An example of a polyester is polyethylene terephthalate. Examples of fluoroplastics are Teflon (PTFE and CTFE), fluorinated ethylene propylene (FEP), and polyvinylidene fluoride (PVDF). An example of a polymide is Kapton. Also, all of these types of materials are either thermosets or thermoplastics. These traits allow some forms of rigidization to be possible.

A thermoset is a material that when heated maintains its shape, and the process is not repeatable. A thermoplastic is a material that will melt when heated and solidify when cooled. This process is repeatable (Bradford, 1999, p. 4). Some methods that use these traits and other means for rigidization are fabric impregnation of resin that is cured by ultraviolet light exposure, fabric impregnation of water soluble resin that causes

rigidization upon water evaporation, fabric impregnation with a resin that rigidizes when cooled below its glass transition temperature, application of heat to cure plastic resin, and application of strain to aluminum laminate beyond its yield point (Freeland, Bilyeu, and Mikulas, p. 5). Rigidization may be desirable because some space inflatable structures, if not rigidized, will require relatively high pressures to maintain their shape. If leaks develop from holes caused by meteoroids, for example, the amount of gas needed to keep the structure's shape may not be practical. Larger inflatable structures that will not require high pressures for inflation will not have the same problem. Their inflation pressure will be around 10^-7 psi (ILC Dover, 1999, p. 11). In fact, "the operating pressure of large antennas is sufficiently low so that they can operate in the meteoroid environment for many years. The replacement-inflatant weight is not excessive" (Friese and Thomas, p. 2). So, rigidization is not necessary for these structures. However, if surface accuracy is important to a particular inflatable structure, then shape control may be necessary to maintain its shape.

There are many sources of surface error for an inflatable structure. Some of them are "material stiffness properties and areal variation, material thickness and areal variation, creep, moisture effects, material 'wrinkling' or creasing due to handling and packaging, fabrication, analytical shape prediction, edge support conditions, pressure level, thermal distortion, and gravitational effects in earth testing" (Bilyeu, Freeland, and Mikulas, p. 9). With so many sources of error, a capable actuation system may be needed for certain applications of inflatable space structures. Some possible actuation methods are adjusting edge radial displacements, controlling internal pressure, using thermal gradients across the structure surface, and incorporating piezoelectric materials into the

body of the structure (Freeland, Bilyeu, and Mikulas, p. 11). Piezoelectric materials, materials that change shape in the presence of an electric charge or produce an electric charge when their shape changes (Shields, p. 7), offer a particularly attractive actuation method because not only could they be used to change the shape of the structure, they could also be used to sense when surface errors arise. This could lead to an active control system.

There are a few ways this active control system could be activated to produce an active control system. Two of these methods involve using an electron gun to control a piezoelectric film and using discrete electrode coatings on a piezoelectric film (Bradford, p. 2). The electron gun would scan the film, inducing an electric charge where needed to maintain the structure's shape (Clayton, p. 2). This scheme doesn't account for feedback of the structure's shape. Leads or some other device would have to be connected to the structure. The discrete electrode coatings, or patches of coated piezoelectric material, could be connected to a control system via leads or some other device that could deliver electric charge and sense it also. This seems to be the most practical. Another method would entail piezo-induced strains on the tie rods, if they exist, of a structure. The implementation of this method would be similar to that of the discrete electrode coatings (Salama et al, p. 5). Also, these types of materials are widely available. Of the previously mentioned materials, PVDF, at least, can have the piezo effect induced into it by permanently polarizing its dipoles by applying a high voltage at high temperature. In general, polymers can undergo this treatment to make them piezoelectric (Salama et al, p. 2). Of note, research has been done to develop materials with a large piezoelectric response suitable for inflatable structure shape control. This research produced several

compositions of pervoskite $PbZr_{1-x}Ti_xO_3$ (PZT) for NASA for use in shape control applications (Neurgaonkar and Nelson, p. 1, 4, and 31).

Inflatable space structures are a developing, attractive technology that will allow missions that were impractical or impossible with conventional technology to become possible. The only other technology that claims that it is an effective alternative to inflatable technology for developing structures in space is space robots used for the assembly of structures. This claim does not take weight or stowed volume into account (Kimura et al, p. 14). If robots did assemble structures, the structure's components would still have to be placed into orbit. If these components weigh the same as conventional components, then there would be no savings in launch cost. Inflatable space structures are an attractive technology that has many applications and much work is being done in this field today.

Current and past funding levels for inflatable research and development are telling signs that there is a considerable amount of interest and enthusiasm regarding this technology. In fiscal year 1997, ten million dollars was spent at the Jet Propulsion Laboratory, NASA centers, the Department of Defense, and industry on inflatable research and development (Chmielewski, 1999, p. 8). In fiscal year 1998, this number grew to twelve million dollars (Chmielewski, 1999, p. 9). In fiscal year 1999, the funding number grew to twenty and a half million dollars (Chmielewski, 1999, p. 10). It is projected that, beginning in fiscal year 2000, inflatable structure funding will double every year (Chmielewski, 1999, p. 22). So, with funding on the increase, many industry organizations are becoming involved in the research and development of inflatable structures.

NASA and the Department of Defense are two of the main players in this technology field, but the number of corporations involved is growing. In 1995, L'Garde, Inc., SRS, Aerospace Recovery Systems, ILC Dover, and Thiokol were the main private organizations that had demonstrated large inflatable structure technology capability (Satter and Freeland, 1995, p. 1). In 1999, Winzen Engineering Inc., Sigma Labs Inc., ITN Energy Systems Inc., Vertigo Inc., Millimeter Wave Technology Inc., United Applied Technologies Inc., Adherent Technologies Inc., Energen Inc., Triton Systems Inc., Aeroplas Corp., and Raven Technologies could be added to the list of organizations with promising inflatable structures technology (Freeland and Helms, 1999, p. 16). All of these corporations are contributing to the body of knowledge of inflatable structures. Their work is paving the way for future uses of inflatable technology.

The current work being conducted in this technology field is the validation of inflatable structures. For example, the Air Force Research Laboratory is conducting work on controlled deployment (of structures from 8 meters to 200 meters), the validation of analytical models and tests, controlled structure interactions (pointing, for example), creating precision surfaces, and enhancing application performance. Other areas that this lab plans to address are creating rigidizing structures for space, developing membranes with good lifetime performance, and enhancing lifetime system performance (Acree, p. 28). With efforts like these, missions proposed for the future will become realities.

NASA has even set some goals for its inflatable structures program. These goals for the mid-term (2000 – 2005) are to develop technology for solar sails, antennas, rovers and to transition sunshields, solar arrays, and radars to industry (Chmielewski, 1999, p. 3). Its far-term goals (2005 – 2020) are to transition solar sails and antennas to industry

and to develop the Gossamer spacecraft architecture (NASA program that uses inflatable technology) (Chmielewski, 1999, p. 3). In fact, NASA is proposing that inflatable structures will be able to assist in a list of varied missions. These are imaging remote galaxies, detecting life on extrasolar planets, monitoring the earth using high resolution, imaging extrasolar planets, imaging active galactic nuclei, sending video from deep space, monitoring earth's environment, investigating planet subsurfaces, communicating optically, providing solar power in deep space, taking short time travel trips, non-Keplerian viewing, transporting cargo to Mars, and developing infrared astronomy (Chmielewski, 1999, p. 2). With goals and aspirations like these, NASA is pushing the development of this technology, and hopefully its near future timetable of inflatable projects may occur according to plan.

As of 1999, NASA planned to have a number of inflatable structures in space through 2020. Some of these are a radar by 2003, the NGST sunshield by 2007, solar sails for a Mercury orbiter by 2007, the Arise satellite by 2008, an interstellar probe by 2010, deep space antennas by 2010, and large optics by 2020 (Chmielewski, 1999, p. 5). This list is ambitious, but with current trends, it may not be unrealistic. However, there is still much work to be done.

Some of the areas that the Air Force Research Lab plans to do work in are areas of general improvement that need to be done to help validate this technology. ILC Dover lists five areas of potential improvement. They are testing and developing rigidizable materials, controlled deployment mechanisms, structural designs, adaptive structure designs, and manufacturing methods (ILC Dover, 1999, p. 38). With continuing effort, these improvements will be made and this technology will become completely validated.

III. EXPERIMENT

A. INFLATABLE STRUCTURE EXPERIMENTAL SET-UP

To begin to explain the work done at the Naval Postgraduate School (NPS), this section will discuss the equipment and procedure used for this experiment. The facility used was the Spacecraft Research and Design Center (SRDC) in Halligan Hall at NPS. The procedure used for this experiment was adapted from the work of Dr. Moktar Salama and Dr. C. P. Kuo of the Jet Propulsion Laboratory (JPL). Parts of the procedure were developed exclusively for this experiment, though. To begin this chapter, however, an in depth look at the equipment used for this experiment will be presented.

The pieces of equipment used for this experiment were procured from various sources. They were made in-house, purchased from industry, borrowed from other departments at NPS, or taken from the existing inventory of the SRDC. The major pieces of equipment used were a polyvinylidene fluoride (PVDF or Kynar) membrane, a polyvinyl chloride (PVC) drum with clamp, a tank of pressurized nitrogen gas, a low pressure air regulator, a voltage source and computer interface used for taking measurements (d-Space), an amplifier, copper tape, a displacement measurement laser, a low current power source, an oscilloscope, and various wires and tubes to connect it all together. The PVDF was the principle piece of equipment used since its response to different voltages and pressures was being studied. Figure 2 shows the drum, PVDF, and laser set-up.

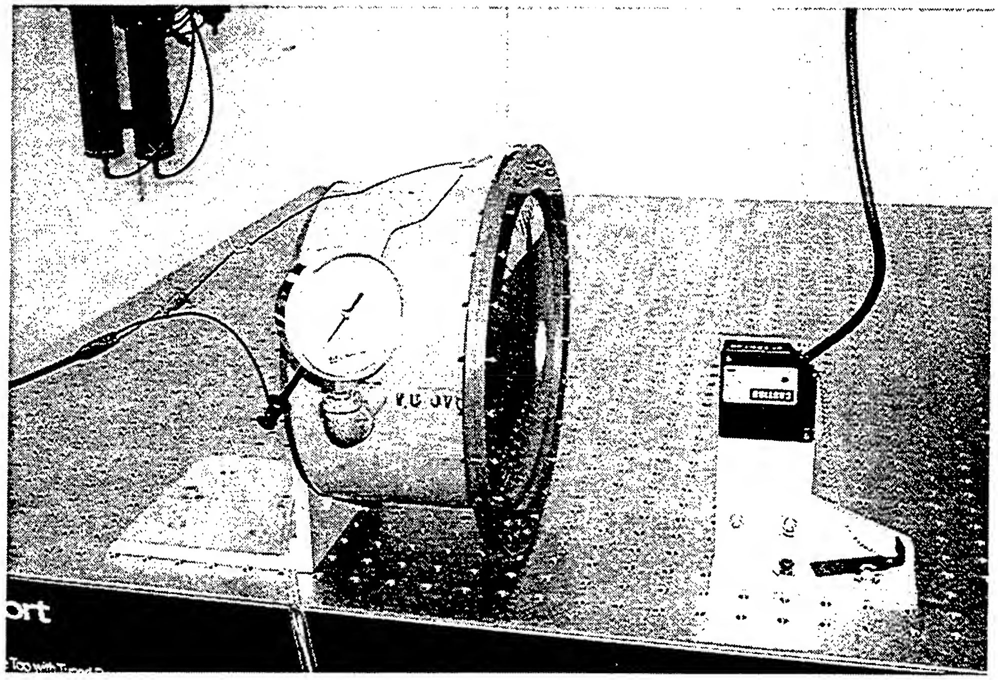

Figure 2. Experimental Set-Up.

Membranes were purchased from a company called Measurement Specialties, Inc. The PVDF membranes are 52 micrometers (0.0020488 in) thick cut in a circular pattern with a 26.65 cm (10.5 in) diameter. A lead for a voltage source attachment was extended from the circular pattern, making the membrane look somewhat like an apple with its stem. The membranes are piezoelectric, poled to create a mechanical response (contraction or expansion) in the "3" or thickness direction when an electric field is applied. On both sides of each membrane is a thin coating of NiCu alloy, used as a conductor to apply an electric field to the membrane. To conduct the experiment, one membrane was attached to a PVC drum. A schematic of the experiment and its components can be seen in Figure 3.

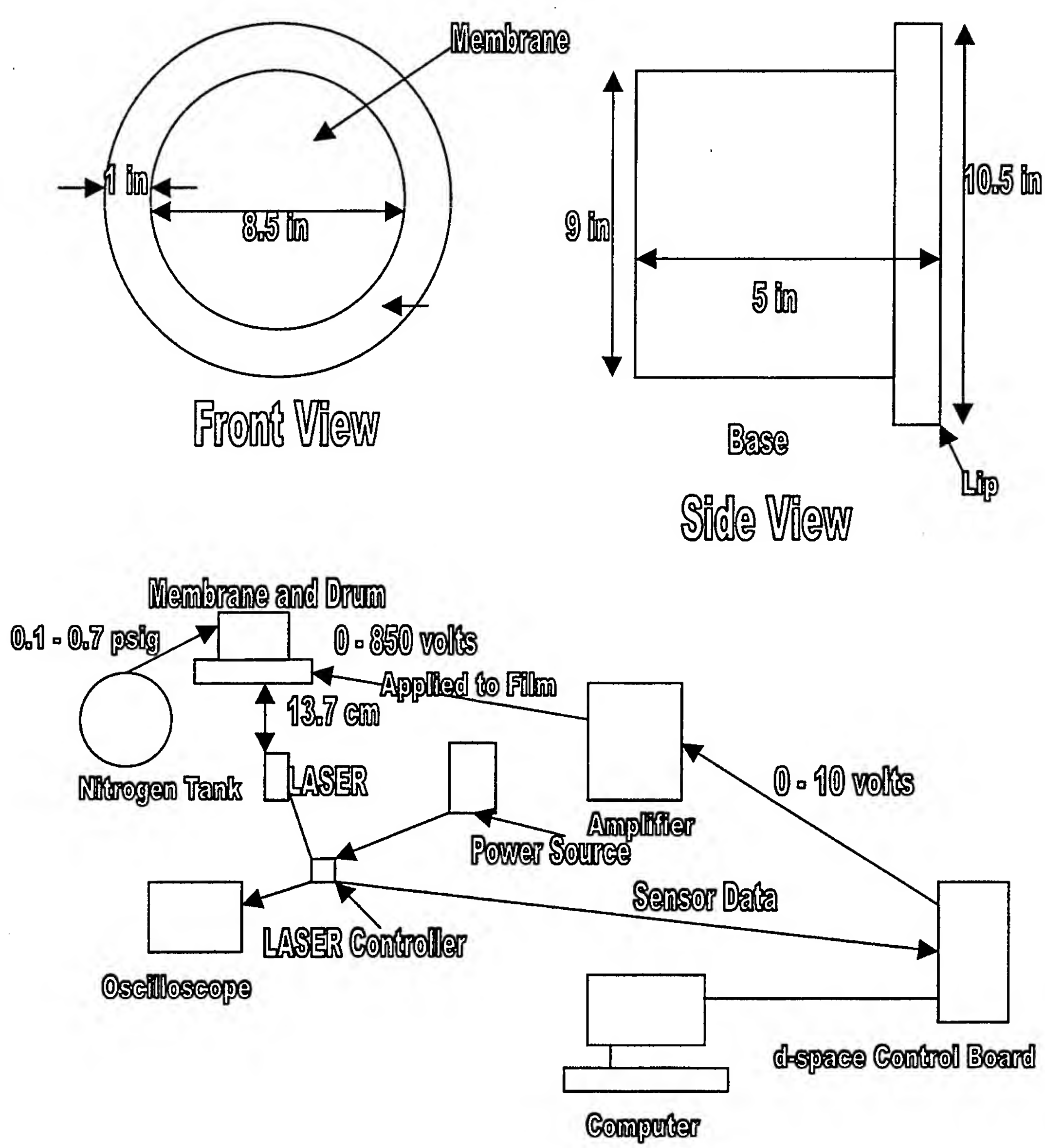

Figure 3. Schematic of Experiment.

The drum has two basic parts. These parts are the base and the lip. The base is a cylinder that is open on one end and closed on the other. The outer diameter of the cylinder is 22.84 cm (9 in) and the inner diameter is 20.30 cm (8 in). The depth of the cylinder is 12.70 cm (5 in). The lip is rigidly attached to the cylinder on its open end and has an outer diameter of 26.65 cm (10.5 in) and an inner diameter of 21.57 cm (8.5 in).

The lip's thickness is 0.63 cm (.25 in). The lip has twenty-four 0.32 cm (0.125 in) diameter holes spaced evenly around it so that a clamp can be fastened to the lip. Placing the membrane between the lip and clamp secures the membrane so that the area from 10.79 cm (4.25 in) from the center of the membrane to the outer edge of the membrane for all 360 degrees of the circle is rigidly fixed. Twenty-four screws and nuts were used to attach the clamp. This didn't make the drum and membrane airtight, but it was made tight enough to hold enough nitrogen so that an air regulator could maintain a constant pressure.

A tank of nitrogen gas was used to provide the gas needed to pressurize the drum and membrane. A low-pressure gas regulator was attached to the nitrogen tank to supply the needed pressure to the drum and membrane. The regulator used was a Matheson ® Gas Products regulator model number 8-2. It is rated to receive pressures up to 20.7 MPa (3000 psi) and deliver pressures up to 20.7 KPa (3 psi). The tank offered enough nitrogen for the experiment, and the regulator supplied the proper amount of pressure to the membrane. Varying pressures caused varying displacements in the shape of the membrane, but applying an electric field to the piezoelectric membrane would also cause membrane displacements.

To apply an electric field, a voltage source was used. This was accomplished using d-Space. A program written by Christian Taranti of NPS controlled the voltages delivered to the experiment (0 to 8.5 volts). Since the response of hundreds of volts applied to the membrane was desired, a high gain amplifier was used. The amplifier, a Trek HV power supply amplifier, model 50/750, with a gain of one hundred, was used to increase the voltage applied to the membrane. To connect these pieces of equipment to

the membrane, two strips of copper tape were applied, one on each side, to the "stem" of the membrane. Leads were soldered onto the copper tape, and wires were used to connect the voltage source to the amplifier to the soldered leads of the copper tape. With the copper tape adhesive attached to both sides of the membrane, a positive and negative lead could be attached to the membrane. In this experiment, either the positive or the negative lead was attached to the side of the membrane facing away from the inside of the drum, and then the other lead was attached to the side of the membrane facing toward the inside of the drum. This will be important later for the discussion about the reaction of the membrane to the applied electric field. So, when an electric field was applied to the membrane, further displacements occurred. To measure these displacements, a laser measurement system was used.

A laser made by Matsushita Electric Works, Ltd. was used in this experiment. This laser is class II (685 nm wavelength) with a beam projector and receiver in one unit. The model used was an ANR12151, which has a measurable range of +/- 50 mm. The output of the laser measurement system ranges from –5 Volts to +5 Volts. So, a 1 mV reading would theoretically equate to a 10-micrometer displacement. To operate this laser, a Power Designs Inc. transistorized power supply, model number 2015R, was used. It provides a voltage range of 0-20 Volts DC at 0-1.5 Amps. For this laser, the power supply was set at 15 Volts DC at 0.3 Amps. For a stationary target, like this one, this laser will produce the best resolution (20-micrometers) when the lowest speed selector switch setting (10 Hz) is used. Therefore, the 10 Hz setting was used for this experiment. To measure the displacements, the drum and membrane were fastened to a table so that the membrane was perpendicular to the table. The laser was attached to a structure that

placed the projector of the laser facing at the center of the membrane. So, deflections of the center of the membrane could be observed. See Figure 2 for more detail.

To display the displacement information, a Hewlett Packard 500 MHz oscilloscope, model number 54610B, was connected to the laser measurement system. A voltage signal from the laser could be seen on the screen of the oscilloscope when the laser was measuring displacements. The average voltage of the laser signal (256 setting on the Average selector) was used as the reading for general observation purposes. The d-Space system was used to collect the data from the laser measurement device. The same program that set the application voltage was also used to collect the displacement data. Two minutes were allowed to pass to let the membrane settle, and then measurements were taken for intervals of one minute. Approximately 60,000 measurements were taken per minute. These 60,000 measurements were averaged to create a super-measurement. When three super-measurements had been taken that were within a defined (arbitrary) tolerance range (one sixth of $\sqrt{((\Sigma v^2)/n)-((\Sigma v)/n)^2}$ n = number of measurements, v = measured voltage from laser) they were averaged and reported. This tolerance range approximated a steady state value. If one of these super-measurements did not fall within this tolerance range, the oldest one was disregarded, and a new super-measurement was taken until three super-measurements fell within the tolerance range. The three super-measurements were then averaged for a final reading.

Better results may have been found by using more sophisticated equipment that could be set and read more accurately. A laser that has a more fine resolution could be used, or sensors better able to detect micrometer deflections, like eddy current sensors, could be used. A more accurate low-pressure gas regulator or an airtight drum and

membrane apparatus could also be used. Of note, some errors may have been introduced when a 2.54 cm (1 in) diameter circle of VHT brand high-temperature white auto paint (SP-101) was placed on the center of the membrane facing the laser measurement system. This was done because without it, the membrane face, silver in color and very reflective, would not scatter the laser beam enough so that the laser receiver could sense any return from the membrane surface. White reflects light well, and the paint helped scatter the light. This paint was applied at the point of laser beam contact with the membrane so that the laser receiver could sense a return. Therefore, the results of a similar experiment could be more accurate if less is done to the membrane physically and more sophisticated equipment is used.

When taking experimental data, the readings provided by the laser measurement system did not appear to be linear and were therefore not reliable. So, before any measurements were recorded, the laser was calibrated in the lab, and, using this calibration data, a MATLAB m-file, also written by Christian Taranti, was used to convert laser voltage readings into distances.

For each of ten pressure settings (0.1 psi, 0.2 psi, etc.) the laser measurement device was used to measure the deflection of the membrane under pressure loads alone. This was done so that the analytical model could be compared to the experimental results for pressure loading only. This is displayed in the next chapter. To begin the study of the membrane's piezoelectric response to an applied voltage, the pressure inside the drum and membrane apparatus was set using the low-pressure regulator and nitrogen gas tank. Starting at 690 Pa (0.1 psi) and increasing by increments of 1380 Pa (0.2 psi), the pressure was increased to 4830 Pa (0.7 psi). At each pressure, voltage was applied to the

membrane. The voltages ranged from 0-850 Volts, applied at increments of 50 Volts. The actual voltages delivered, however, were 0, 50, 99.5, 148.9, 198.4, 247.9, 297.2, 346.7, 396.1, 445.6, 495.1, 544.4, 594.0, 643.3, 692.9, 742.3, 791.6, 841.1 volts due to line losses. Further data manipulation was conducted in an Excel spreadsheet to calculate the distance the membrane moved from a reference of zero applied voltage at a given pressure with increasing applied voltages.

Several errors, besides that introduced by the white paint, was introduced into the measurements. The laser measurement device has a +/- 0.8 % error, and lighting conditions, laser resolution, inaccurate pressure settings, temperature (gas expansion or contraction), line losses, or noise (vibration) could have contributed to differences in readings. The following section will examine the results of the experiment and analyze the data.

B. INFLATABLE STRUCTURE EXPERIMENTAL RESULTS

This section will discuss the results of the experiment mentioned in the previous section. As mentioned previously, the laser measurement system is not the most accurate sensor that could be used to measure the displacement of the PVDF membrane. However, for every pressure used in the experiment, a general displacement trend was observed for both polarity settings. The membrane's displacement increased or decreased (slightly) by increasing the applied voltage. In other words, the membrane's center got closer to or further away from the laser measurement system when voltage was

applied to it. The data recorded and the graphs constructed from this data can be viewed in Appendix C.

As mentioned earlier, the membrane is coated on both sides by a thin metal layer. The positive electrode is indicated by a plus sign written on it (provided by Measurement Specialties, Inc.). The negative voltage lead was applied to this positive electrode. Voltage was applied creating an electric field with a negative polarity in the direction of the positive electrode (side of membrane facing the laser measurement system) and a positive polarity in the direction of the negative electrode (side of membrane facing the inside of the drum). The displacement of the membrane due to this electric field was in the direction of the laser measurement system. The positive and negative voltage leads were also reversed in position, but the response of the membrane to this configuration resulted only in displacement at 0.1 psig. At this pressure, the force pushing on the membrane was not so great as to hinder the movement of the membrane due to the piezoelectric effect. All other pressures tested did not allow such movement, perhaps due to an increased tension in the membrane that could not be overcome by piezoelectric induced movements. The results will be shown later.

Not initially being given the poling direction (defined as the direction from negative voltage lead to the positive voltage lead in the poling process) of the membrane by Measurement Specialties, Inc., it was derived from the information obtained through experimentation and other information provided by Measurement Specialties, Inc. A voltage applied to a piezoelectric ceramic material that is opposite in polarity to the poling direction results in a compression of the membrane in its thickness ("3" direction) and expansion of the membrane in its length and width directions ("1" and "2"

directions). This movement appears to be what occurred in this experiment when the negative lead of the voltage source was attached to the positive electrode. The internal pressure of the drum pushed the membrane out further when higher and higher voltages were applied. This occurred because the membrane had increasing amounts of slack (less taught) in the length and width directions. So, the membrane was capable of being pushed out more by the internal pressure. If the poling direction were in the direction of the applied voltage polarity, the thickness of the membrane would increase, contracting the length and width of the membrane. This would make it more taught and less capable of being pushed out by the internal pressure of the drum. In fact, the membrane would not be pushed out toward the laser measurement system in this set-up but would in fact either remain in its position or retreat from the laser measurement system. This appears to be what occurred when the positive lead of the voltage source was attached to the positive electrode. However, after receiving poling information from Measurement Specialties, Inc., the poling direction of the membrane was derived.

The poling direction of the film, in the thickness "3" direction, is in the negative electrode direction (away from the laser measurement device). This was determined using the following information. For piezofilms, the d constant ("ratio of strain developed along a specific axis to the value of electric field applied parallel to a given axis" (Shields, p. 13 – 14)) is negative in the "3" direction. This is just the opposite of the d constant of a piezoceramic. A positive "applied voltage produces a negative strain (i.e., the film gets thinner)" (Measurement Specialties, Inc., p. 3). The positive lead was placed on the side of the membrane that the poling direction pointed toward (the side facing away from the laser measurement device), and the film got thinner. The positive

electrode plus sign seems to have no correlation to the poling direction, unless it indicates the opposite of the poling direction. Knowing why the membrane behaved the way that it did, it is now appropriate to examine the amplitudes of the displacements.

Table 1 shows the displacement of the membrane at each internal pressure due to the piezoelectric effect induced by an applied voltage of 850 volts.

Internal Pressure of Drum (psi)	Total Displacement (micrometers)
0.1	169.786
0.3	92.03
0.5	183.6914
0.7	151.3092

Table 1. Displacement of Membrane due to Piezoelectric Effect (850 volts) and Pressure

These values are based on data collected and recorded by d-Space for each of the four pressure settings. They represent the displacement due to the application of 850 volts. The expected results are a larger displacement of the membrane for larger applied voltages. This was observed and can be seen in Figures 4, 5, 6, and 7.

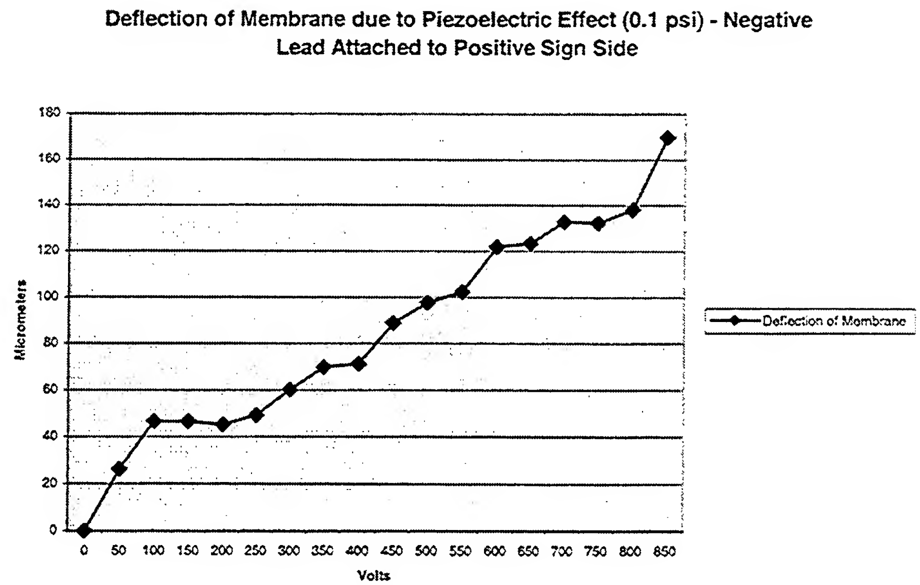

Figure 4. Deflection of Membrane due to Piezoelectric effect (0.1 psi) – Negative Lead Attached to Positive Sign Side

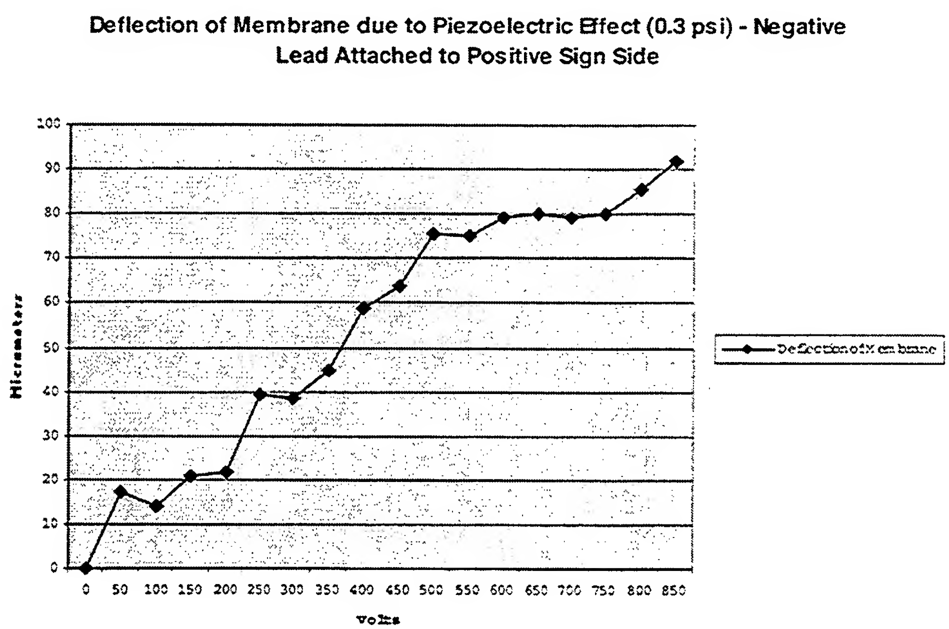

Figure 5. Deflection of Membrane due to Piezoelectric effect (0.3 psi) – Negative Lead Attached to Positive Sign Side

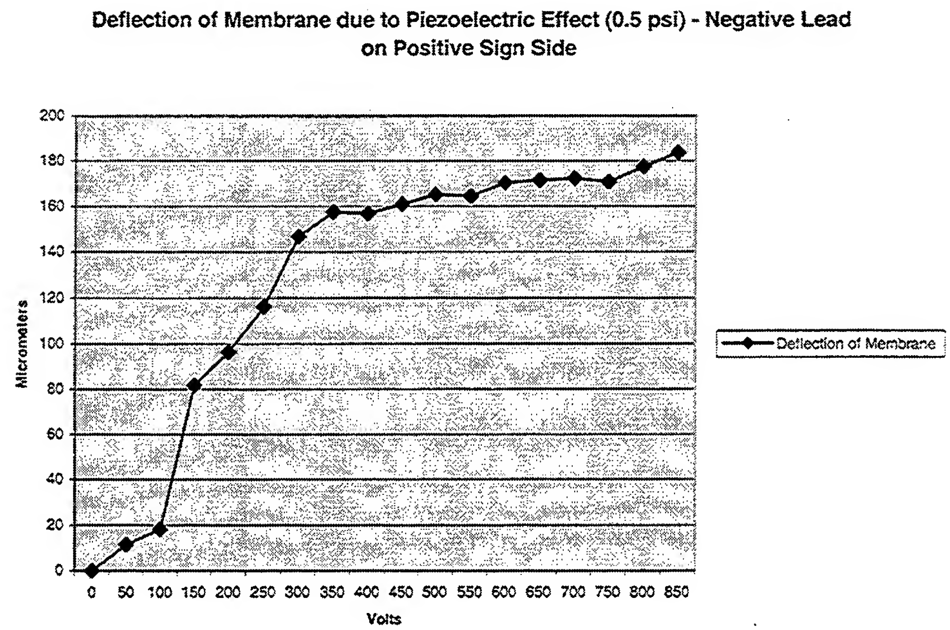

Figure 6. Deflection of Membrane due to Piezoelectric effect (0.5 psi) – Negative Lead Attached to Positive Sign Side

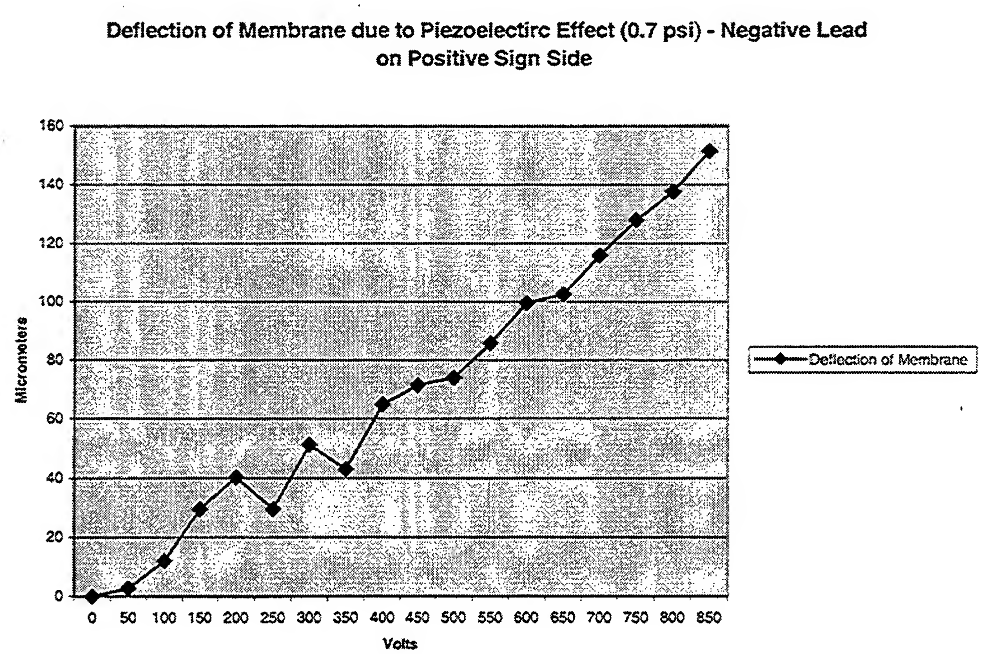

Figure 7. Deflection of Membrane due to Piezoelectric effect (0.7 psi) – Negative Lead Attached to Positive Sign Side

The displacement of the membrane at each pressure setting shows a general increase in the laser measurement system direction for each pressure setting. All of the graphs show a displacement in the same direction. For the measurements collected with the positive voltage lead on the positive electrode (plus sign side), the results showed that the membrane did not move in either direction, except for 0.1 psig, for reasons mentioned earlier. Figures 8, 9, 10, and 11 show this.

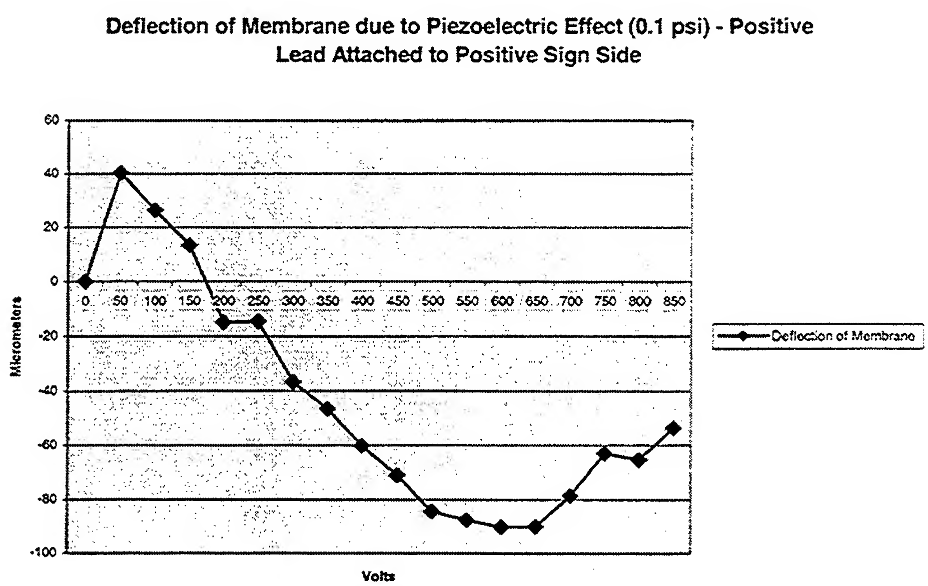

Figure 8. Deflection of Membrane due to Piezoelectric effect (0.1 psi) – Positive Lead Attached to Positive Sign Side

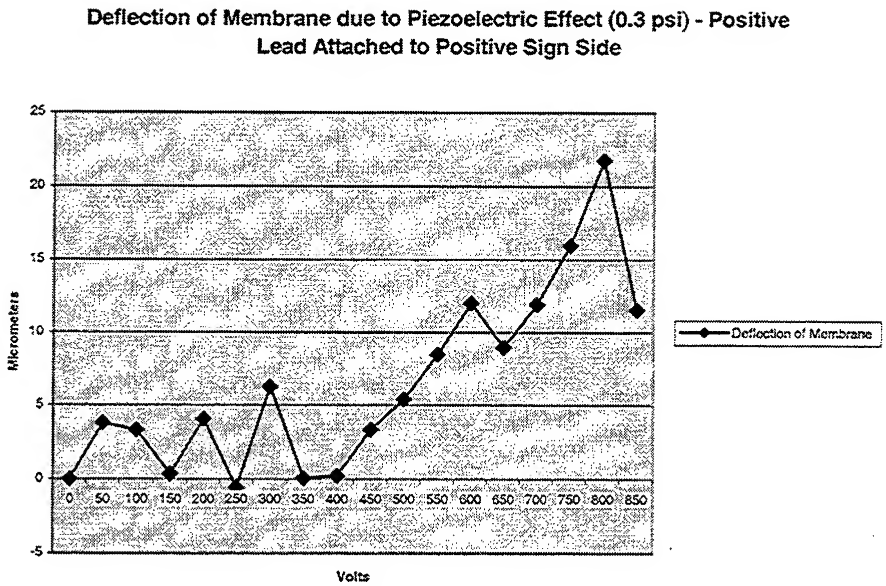

Figure 9. Deflection of Membrane due to Piezoelectric effect (0.3 psi) – Positive Lead Attached to Positive Sign Side

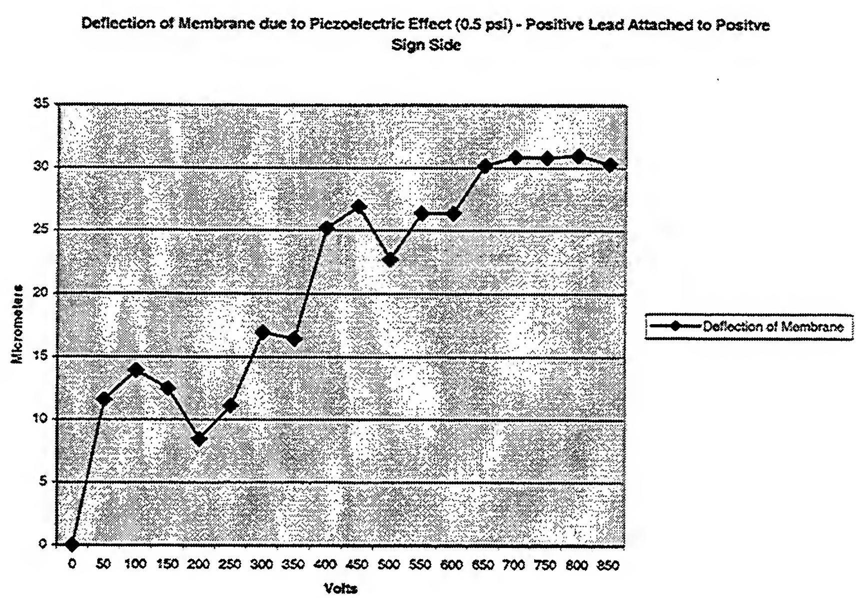

Figure 10. Deflection of Membrane due to Piezoelectric effect (0.5 psi) – Positive Lead Attached to Positive Sign Side

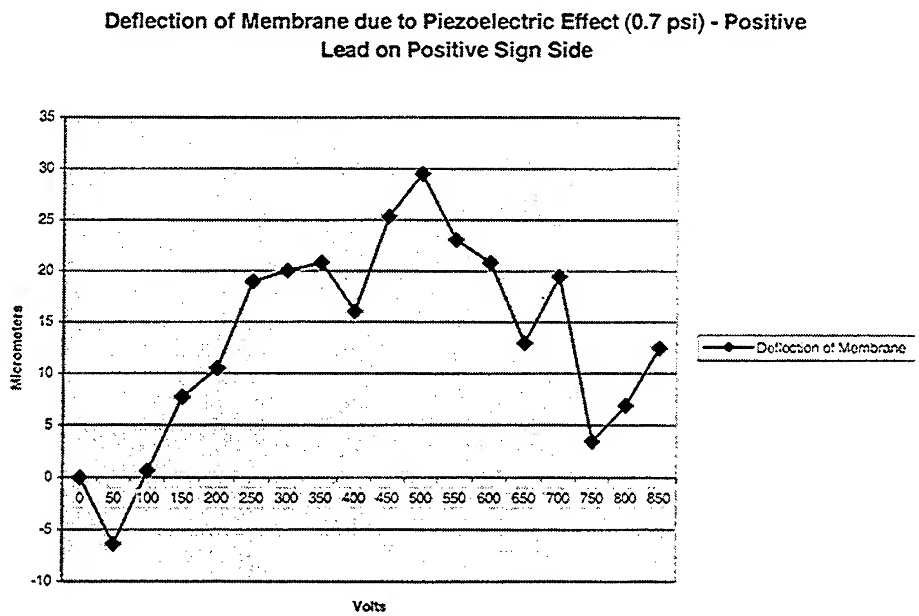

Figure 11. Deflection of Membrane due to Piezoelectric effect (0.7 psi) – Positive Lead Attached to Positive Sign Side

The resolution of the laser measurement device is only 20 micrometers, so the measurements for Figures 9, 10, and 11 show that the displacement was inside or very near this resolution. With this in mind, the membrane did not move for these pressure settings when the positive voltage lead was placed on the positive electrode of the membrane. With better measurement devices, however, better displacement readings could be obtained and then displacements could accurately be predicted for given pressure settings. With this knowledge, an actuation system could be developed to take advantage of these displacements.

An alternate method obtain values of displacement under this set of applied loads is through modeling the piezoelectric film as a thin shell. By using MSC/PATRAN and MSC/NASTRAN, or similar analytical modeling programs, this membrane can be

modeled and evaluated. Once the model responds like the experimental set-up to pressure and voltage, evaluation of the piezoelectric film in space application situations can be performed. The next chapter describes the efforts in accurate modeling of the piezoelectric film as a thin shell undergoing large displacements nad large rotations using the nonlinear incremental finite element options of MSC/NASTRAN software.

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IV. ANALYTICAL MODEL SET-UP AND RESULTS

The analytical model used in this research was created using MSC/PATRAN and MSC/NASTRAN software. The software was used to create the geometric model, and combinations of pressure and voltage that were observed in the experiment were applied to the model. This chapter describes the modeling aspects of the thin piezoelectric film.

MSC/PATRAN and MSC/NASTRAN are capable of modeling piezoelectric materials by using a thermal analogy. The piezo strain constants of the material are converted into coefficients of thermal expansion. This is done using the following equation: $\alpha_{eq} = d / t_{piezo}$ (d = piezo strain constant, t = thickness). The coefficient of thermal expansion (α_{eq}) can then be prescribed to the experimental model as a material property in the analysis. The values of the voltage applied corresponds to the temperature that is to be used in the MSC/NASTRAN model (in this model, degrees fahrenheit). The values of the thermal coefficients of expansion are presented in Appendix D. There is a value for the "1" direction and the "2" direction. However, in MSC/PATRAN, as a first approximation of the study, the average of the two coefficients of thermal expansion was used in an isotropic setting. This approximation, as seen later, introduces a small percentage of error in the response of the film to applied loads.

MSC/PATRAN is a graphical user interface package used to model structural and thermal problems. It generates an interface to run MSC/NASTRAN analysis. The structural and thermal aspects were modeled using MSC/PATRAN. The model from MSC/PATRAN was then used to create an input file, (.bdf or .dat) for MSC/NASTRAN. MSC/NASTRAN, a multi-disciplinary finite element analysis tool, is used in computing

the response in the form of displacements, rotations, stresses, etc., based on input geometry, boundary conditions, and loads.

> The finite element method offers virtually unlimited problem generality by permitting the use of elements of various regular shapes. These elements can be combined to approximate any irregular boundary. In similar fashion, loads and constraints of any type can be applied (Miller, p. 3).

The piezoelectric fim (approximate thickness of 0.002 in) modeled as a thin-shell undergoes large displacements and large rotations (also note that E is of the order of 500,000 psi). For the given pressure loadings and the temperature loadings, the displacements of the film are several thousand times the thickness. This behavior requires the use of a nonlinear approach as displacements and rotations are large (linear strain-displacement approximations are violated) and as such MSC/NASTRAN has the capability to analyze such problems. The input deck generated by MSC/NASTRAN is changed (or edited) to incorporate the analysis parameters for computing the response of the thin shell to the applied loadings. Before any solutions could be obtained, though, inputs into the MSC/PATRAN model had to be made.

The MSC/PATRAN model was constructed using 216 finite elements. This was accomplished by placing 36 mesh seeds about the perimeter of of an 8.5 in membrane. This size was selected for the analytical model corresponding to the diameter of the membrane that is not rigidly clamped by the lip and drum of the experiment. Figure 12 shows the finite element model developed in MSC/NASTRAN.

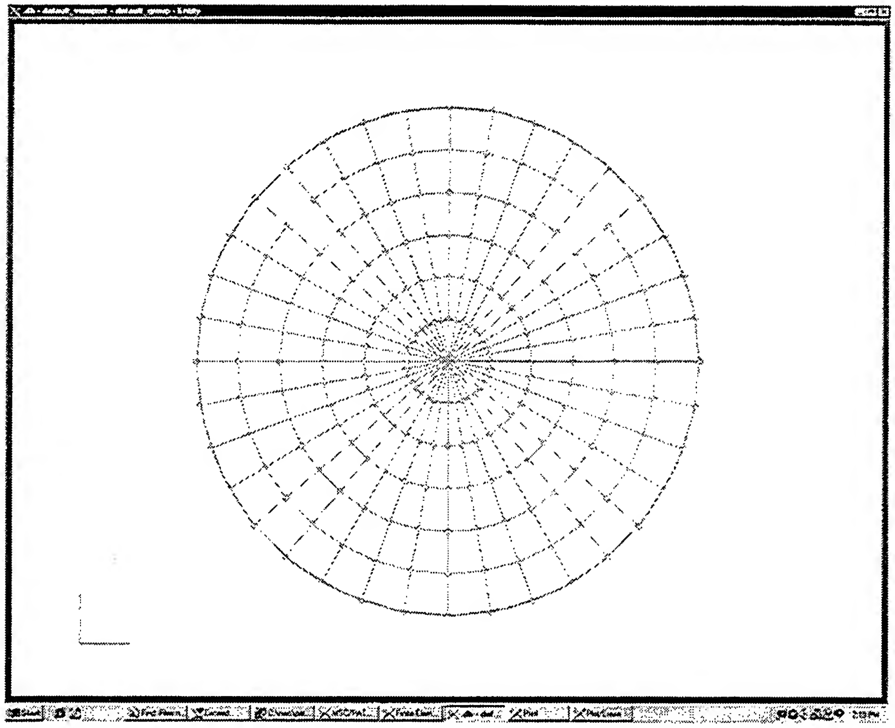

Figure 12. Finite Element Model Produced in MSC/PATRAN

Another assumption made was the modulus of elasticity of the membrane. Measurement Specialties, Inc. gives a range of the modulus of elasticity of PVDF at a 52 micrometer thickness from 2 – 4 Gpa (290,000 psi to 580,000 psi). A modulus of elasticity of 537,500 psi was used in the analytical model.

Once the .dat file was generated, it was manipulated to solve a non-linear problem for multiple pressure and temperature combinations. The code solved for displacements due to each pressure setting and one temperature. So, the .dat file was changed for each temperature and run in MSC/NASTRAN. The MSC/NASTRAN analysis provided .fo6 files that included the displacements of the first nine elements of the finite element model of the membrane. These displacement vectors were compiled and placed in a word processor file (these values are in inches). The displacement vectors and the .dat file can be seen in Appendix D.

Figure 13 presents the results of the maximum displacement of the center as the pressure is increased. As can be seen, the maximum displacement at 0.1 psig is about a thousand times the thickness of the membrane. As mentioned earlier, the observed values have 'rounding off' errors in getting the measured displacements. The MSC/NASTRAN results agree well with the finite element results published by JPL. They also agree well with measured deflections of the membrane under solely pressure loads. Of note, the reference starting point for all three curves in the graph in Figure 13 is the membrane displacement at 0.1 psig as calculated by the MSC/NASTRAN code developed here at NPS. This was done to show the relative displacements of the three measurement attempts from a common reference.

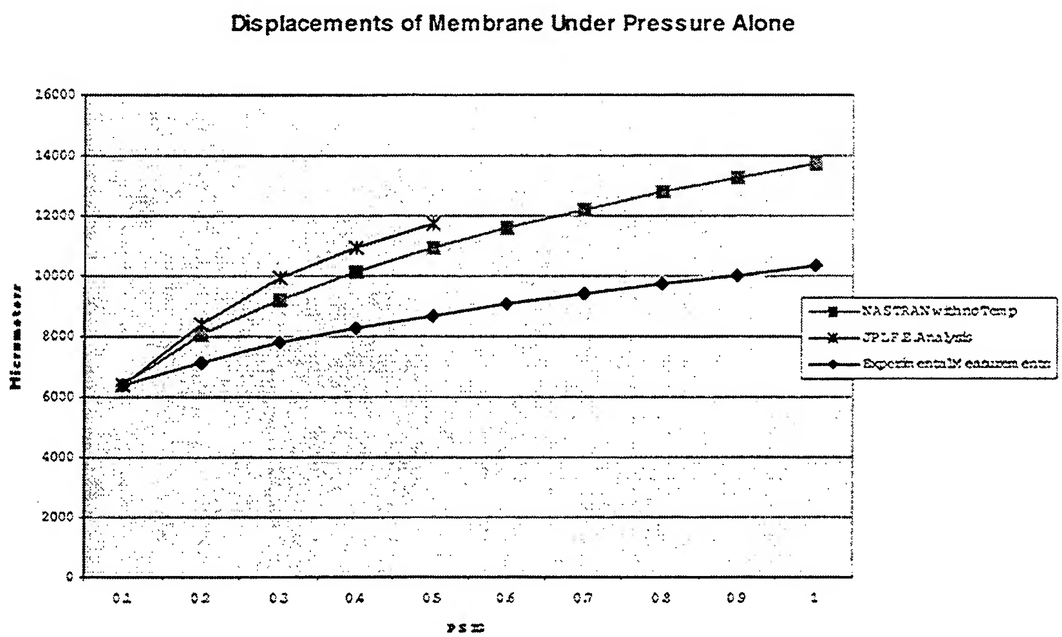

Figure 13. Displacements of Membrane with only Internal Pressure Applied

The results of the analytical model when temperatures were applied, matched nicely with the experimental results. When different temperatures were put into the code,

the resulting displacements followed the same trends observed in the experiment. Graphs of these results can be seen in Appendix D. Two examples, Figures 14 and 15 follow.

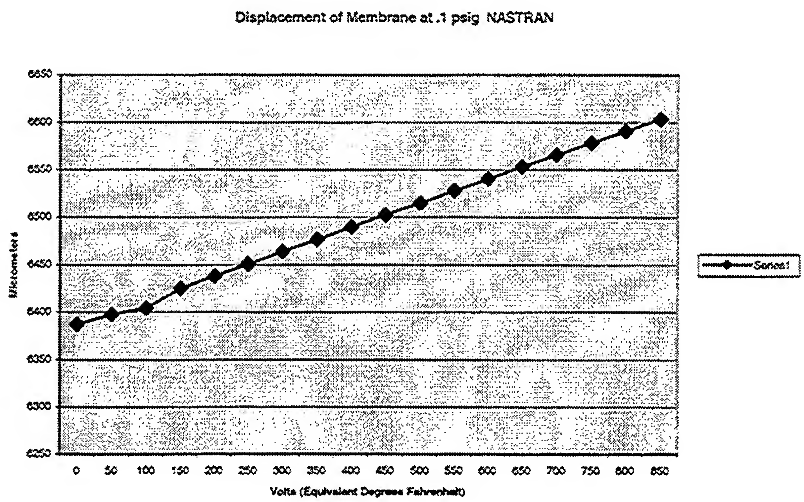

Figure 14. Analytical Model Results of Displacement of Membrane Exposed to .1 psig and Positive Temperatures.

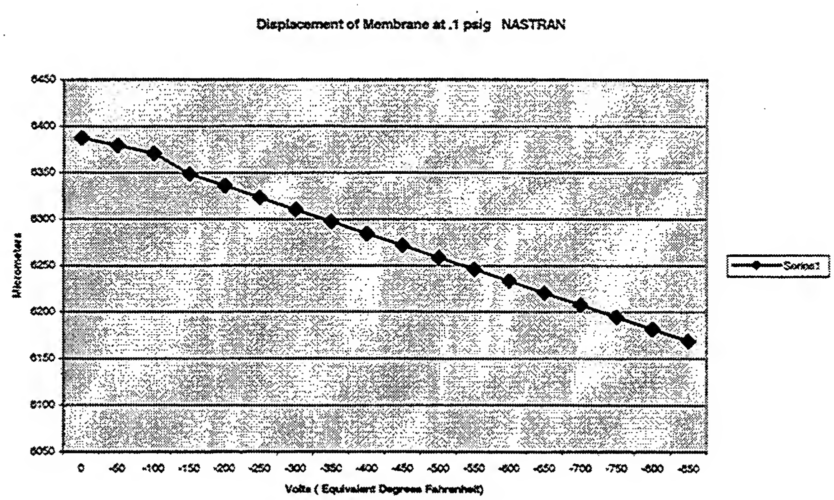

Figure 15. Analytical Model Results of Displacement of Membrane Exposed to .1 psig and Negative Temperatures.

Decreasing a negative temperature caused a decrease in the displacement of the membrane. An increase in temperature resulted in increases in displacement. In the experiment, an increase in voltage with the negative lead of the voltage source attached to the positive electrode of the membrane increased the displacement of the membrane. An increase in voltage with the positive lead of the voltage source attached to the positive electrode of the membrane did not change the displacement of the membrane. The latter experimental configuration corresponds to the decreasing temperature configuration for the analytical model. The model shows a negative displacement due to decreasing temperature, but the experiment showed that the membrane was not capable of moving in that direction with internal pressures higher than 0.1 psig, most likely due to increased tension in the membrane due to the higher pressure loads. The analytical model does make intuitive sense, because if the temperature of the membrane were reduced, it would not expand, but it would contract. This would correspond to a piezoelectric material becoming thicker in the "3" direction and shorter in the"1" and "2" directions. The increasing temperature configuration in the analytical model corresponds to the experimental configuration of the negative lead of the voltage source attached to the positive electrode of the membrane. An increasing temperature would expand the membrane, and this corresponds to a membrane becoming thinner in the "3" direction and longer in the "1" and "2" directions. Of note, if a positive temperature is applied to the membrane before a pressure load is, the rigidly bounded membrane will buckle. NASTRAN is then incapable of proceeding further. A pressure load needs to be applied first, giving stiffness to the membrane, allowing the temperature loads to be applied without buckling the membrane.

In the experiment, as has been mentioned before, there are a few things that may have contributed to inaccuracies in the results of the experiment. Also, there may be inaccuracies in the results obtained by the model. Inaccuracies may have been introduced because the average of the coefficients of thermal expansion may not be an accurate way to implement the temperature analogy, or the modulus of elasticity may not be accurate for the membrane used in this experiment.

A milestone in this research was establishing a nonlinear MSC/NASTRAN model that uses pressure and temperature loadings to calculate the displacements of an extremely thin membrane. Future work could be done to introduce membranes of larger size into the space environment. Also, the model can be used to determine the response of larger inflated structures to analogous voltage inputs. Optimum placement of piezoelectric films on large inflatable structures for desired responses could also be accomplished. This work can be used as a starting place for such future work.

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V. CONCLUSIONS

Inflatable thin film space-borne structures are revolutionary in terms of mass, stowed volume, and capability. The Navy and the Department of Defense should investigate using these materials in future space-borne communications platforms. It has been shown that a lot of work has been done and is going to be done with this technology, and its attributes far outweigh any drawbacks (which are very few in number). The enhanced communications capabilities that large antennas made of these materials offer are phenomenal. However, this technology is not quite ready for use in this application.

Surface errors in the shape of large parabolic antennas caused by the space environment can degrade the performance of these antennas, therefore some form of shape control has to be implemented to maintain the ideal shape of these antennas. Using piezoelectric material is one solution to this problem. The research done for this thesis shows that piezoelectric thin films are plausible materials to be used to help maintain shape. Not only can they be used to change an inflatable structure's shape, they can also be used to sense when the ideal shape has been changed. Through experimentation, it has been shown that the shape change of a piezoelectric thin film under pressure is repeatable. By developing a nonlinear MSC/NASTRAN model of a thin film under pressure and thermal loads, it has been shown that computer models can be constructed that will help predict and optimize piezoelectric thin film usage.

This thesis continued with the work of Dr. Salama, Dr. Kuo, B. Wada, and M. Thomas. Their work was very similar, but the research reported here placed a membrane

of a different size under a higher pressure. Displacements were observed and calculated that, without the influence of voltage or temperature, were very similar in nature to those reported by Salama, Kuo, Wada, and Thomas. They also reported that the out-of-plane displacement of their membrane due to an applied voltage of 300 volts was about .0012 in. The experiment conducted for this research produced an out-of-plane displacement of about .006 in for an applied voltage of 300 volts. The analytical model produced an out-of-plane displacement of about .0020 in for an applied voltage of 300 volts. However, the out-of-plane displacements for this model were obtained with a different configuration than those obtained by the experiment. They are both approximately, however, in the same range as the results obtained by Salama, Kuo, Wada, and Thomas. They stated that this out-of-plane displacement should scale directly with the diameter of the membrane (their diameter was 10 in). The experimental results for this thesis do not support this statement ((8.5 in / 10 in)*.0012 in = .0010 in, not .006 in). Again, the laser measurement device is not the best instrument that could be used in this experiment, but there could also be error in the results of Salama, Kuo, Wada, and Thomas.

Future work that can be done at NPS includes using better measurement devices to measure surface deflections of the membrane and developing analytical models of large inflatable structures and predicting their behavior and performance. Also, conducting temperature experiments on the membrane and drum to see if this has an effect on deflection and testing for the modes and natural frequencies of the membrane could be pursued. There is a lot of work left to be done on this technology, and the Navy and the Department of Defense should keep a watchful eye on the progress of the developments of this technology.

The Navy and the Department of Defense could benefit greatly from using inflatable antennas on communications satellites. They are light and compact when stowed, both of which help reduced the size of the launch vehicle and subsequently the cost of the program. The enhanced capabilities that larger antennas bring to warfighters, especially disadvantaged users with limited power and antenna size are incredible. With information superiority becoming more and more important, this capability is becoming more and more valuable. Planning ahead now and investing in this technology will ensure its growth and rapid maturity. Using this technology is just one piece of the puzzle that will bring true information superiority to all Department of Defense personnel. Inflatable space structures will be a part of the future, and hopefully, they will be a part of the Navy's and the Department of Defense's future as well.

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APPENDIX A. EQUATIONS USED FOR ANTENNA OPERATIONAL ANALYSIS

Equation	Source
Wavelength = C / frequency	Larson and Wertz, p. 242
antenna gain = $\pi^2 D_r^2 \eta / \lambda^2$	Larson and Wertz, p. 521
degraded antenna gain = $\eta(\pi D_r/\lambda)^2 e^{[-(4\pi\varepsilon/\lambda)^{\wedge}2]}$	Cassapakis, Love, and Palisoc, p. 456
EIRP = $P_t + G_t - L_{line}$ (in dB)	Baldwin, p. 36
FSPL = 32.4 + 20log(Freq(MHz)) + 20log(D(km)) (in dB)	Baldwin, p. 36
No = 10log(K) + 10log(T_e) (in dB)	Tomasi, p. 748
C = EIRP – FSPL + $G_r - L_{line}$ (in dB)	Baldwin, p. 36
C/No = C – No (in dB)	Tomasi, p. 749
N = bandwidth + No (in dB)	Tomasi, p. 748
C/N = C – N (in dB)	decibel mathematics
Beamwidth = $21*10^9$ / frequency*D_r (degrees)	Douglas, p. 74
D (km) = sin(λ_{FO})(6378)/sin(nadir ang+ beamwidth)	derived
L_F (km) = $K_L(\lambda_{FO}-\lambda_{FI})$	Larson and Wertz, p. 163
W_F(km) = $R_E \sin^{-1}$(Dsin(beamwidth)/ R_E)	Larson and Wertz, p. 164
F_A (km) = $(\pi / 4)\ L_F\ W_F$	Larson and Wertz, p. 165
C/No (overall) = $(C/No)_u(C/No)_d/[(C/No)_u+(C/No)_d]$	Tomasi, p. 758

Throughput (bps) = alog[(C/No – Eb/No – required margin)/10]   Baldwin, p. 36

C/N (overall) = $(C/N)_u(C/N)_d/[(C/N)_u+(C/N)_d]$ Tomasi, p. 758

Shannon's Capacity Limit = bandwidth*$\log_2(1+C/N)$ Baldwin, p. 16

Practical throughput = bandwidth*$\log_2(M)/(1 + R)$ M-ary PSKs (no coding)

Key:

C = speed of light ($3*10^8$ m/s)
λ = wavelength
η = antenna efficiency
D_r = diameter of receiver
ε = root mean square surface error
EIRP = Effective Isotropic Radiated Power
P_t = transmitter power
G_t = transmitter gain
FSPL = Free Space Path Loss
D = slant range
G_r = receiver gain
L_{line} = line losses
k = Boltzmann's Constant ($1.38*10^{-23}$ J/deg Kelvin)
T_e = equivalent temperature
C = received power
No = noise density
K_L = 111.319543
L_F = footprint length
W_F = footprint width
F_A = footprint area
R = roll-off factor
M = number of modulation symbols (e.g., M = 2 for BPSK)

APPENDIX B. ANTENNA ANALYSIS SPREADSHEETS AND GRAPHS

The material contained in this appendix displays the analysis performed on the link budgets of different ground and space-borne antennas. Graphs display the throughputs possible for different scenarios using the different antennas available. Six different scenarios are displayed.

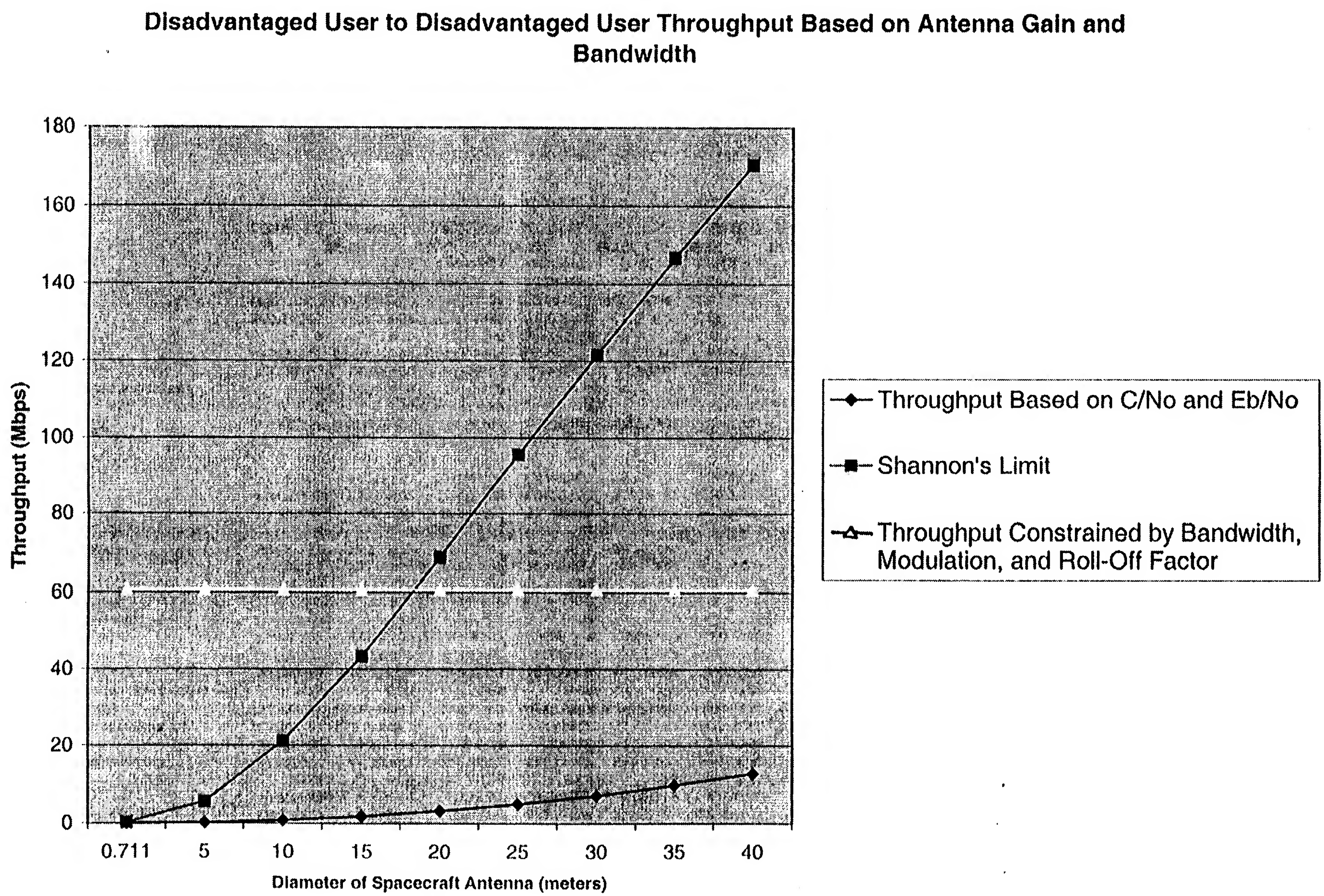
Thesis Antenna Spreadsheet
disadvantaged user to disadvantaged user link

uplink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of disadvantaged user antenna (m)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
transmitted power (dBW)	7	7	7	7	7	7	7	7	7
frequency (Hz)	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09
wavelength (m)	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02
disadvantaged user antenna efficiency	5.50E-01	5.50E-01	5.50E-01	5.50E-01	5.50E-01	5.50E-01	5.50E-01	5.50E-01	5.50E-01
gain of disadvantaged user antenna (dB)	24.248585	24.248585	24.248585	24.248585	24.248585	24.248585	24.248585	24.248585	24.248585
EIRPof ground antenna (dBW)	30.248585	30.248585	30.248585	30.248585	30.248585	30.248585	30.248585	30.248585	30.248585
line losses of disadvantaged antenna (dB)	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
diameter of satellite antenna (m)	1.14	5	10	15	20	25	30	35	40
satellite antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
gain of spacecraft antenna (dB)	37.427882	50.269185	56.289785	59.811610	62.310385	64.248585	65.832210	67.171146	68.330985
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of spacecraft (dB)	37.427882	50.03141159	56.0520115	59.5738367	62.0726114	64.0108117	65.5944366	66.9333724	68.0932113
bandwidth (Hz)	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07
free space path loss (dB)	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on satellite	2710	2710	2710	2710	2710	2710	2710	2710	2710
No (dB)	-194.27031	-194.270307	-194.270307	-194.270307	-194.270307	-194.27031	-194.2703071	-194.27031	-194.27031
received power (C) (dBW)	-139.326132	-126.682040	-120.659799	-117.137670	-114.638789	-112.700540	-111.116888	-109.777936	-108.618087
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	5.494E+01	6.759E+01	7.361E+01	7.713E+01	7.963E+01	8.157E+01	8.315E+01	8.449E+01	8.565E+01
N (dB)	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02
C/N (dB)	-2.435E+01	-1.171E+01	-5.684E+00	-2.162E+00	3.373E-01	2.276E+00	3.859E+00	5.198E+00	6.358E+00
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	2.193E+00	5.000E-01	2.500E-01	1.667E-01	1.250E-01	1.000E-01	8.333E-02	7.143E-02	6.250E-02
lambda (fo) (deg)	12.4601678	2.807219145	1.40293648	0.935208	0.70138422	0.56109931	0.467579111	0.40078021	0.35068161
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	35962.5645	35795.01673	35788.2526	35787.001	35786.563	35786.3603	35786.25023	35786.1838	35786.1408
Lf (km)	1387.06019	312.4983523	156.174248	104.106927	78.0777709	62.4613191	52.05069295	44.6146697	39.0377167
Wf (km)	1.387E+03	3.125E+02	1.562E+02	1.041E+02	7.808E+01	6.246E+01	5.205E+01	4.461E+01	3.904E+01
Fa (km^2)	1.511E+06	7.670E+04	1.916E+04	8.512E+03	4.788E+03	3.064E+03	2.128E+03	1.563E+03	1.197E+03

DSCS III antenna diameter
= .7112 m
DSCS III SLEP parameter

DSCS III S mm
0

downlink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of satellite antenna (m)	0.711	5	10	15	20	25	30	35	40
transmitted power (dBW)	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99
line losses of transmitter (dB)	1	1	1	1	1	1	1	1	1
frequency (Hz)	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09
wavelength (m)	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02
antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
ideal gain of satellite antenna (dB)	27.086669	44.028677	50.049277	53.571103	56.069877	58.008078	59.591702	60.930638	62.090477
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of satellite (dB)	27.0866694	43.97216911	49.992769	53.5145942	56.0133689	57.9515692	59.53519412	60.8741299	62.0339689
EIRPof spacecraft (dBW)	33.0766694	49.96216911	55.982769	59.5045942	62.0033689	63.9415692	65.52519412	66.8641299	68.0239689
diameter of disadvantaged user antenna (m)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
gain of ship antenna (dB)	18.008078	18.008078	18.008078	18.008078	18.008078	18.008078	18.008078	18.008078	18.008078
bandwidth (Hz)	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07
free space path loss (dB)	1.963E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on ship	290	290	290	290	290	290	290	290	290
No (dB)	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602
received power (C) (dBW)	-150.218187	-132.758327	-126.730797	-123.207692	-120.708470	-118.770063	-117.186325	-115.847322	-114.687439
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	53.757833	71.217693	77.245223	80.768328	83.267550	85.205957	86.789695	88.128698	89.288581
N (dB)	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02
C/N (dB)	-2.554E+01	-8.076E+00	-2.049E+00	1.474E+00	3.973E+00	5.912E+00	7.496E+00	8.835E+00	9.994E+00
C/No for entire link (dB)	5.130E+01	6.602E+01	7.205E+01	7.557E+01	7.807E+01	8.001E+01	8.159E+01	8.293E+01	8.409E+01
Eb/No (dB)	10	10	10	10	10	10	10	10	10
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	7.213E+00	1.026E+00	5.128E-01	3.419E-01	2.564E-01	2.051E-01	1.709E-01	1.465E-01	1.282E-01
lambda (fo) (deg)	48.8869961	5.770279287	2.87929486	1.91881237	1.43892115	1.15106729	0.959191226	0.82214762	0.71936992
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	38273.0255	35824.05692	35795.4855	35790.2134	35788.3696	35787.5164	35787.05301	35786.7736	35786.5923
Lf (km)	5442.07807	642.3448532	320.521787	213.601316	160.180045	128.136284	106.776729	91.5210977	80.079931
Wf (km)	5.442E+03	6.423E+02	3.205E+02	2.136E+02	1.602E+02	1.281E+02	1.068E+02	9.152E+01	8.008E+01
Fa (km^2)	2.326E+07	3.241E+05	8.069E+04	3.583E+04	2.015E+04	1.290E+04	8.954E+03	6.578E+03	5.036E+03
modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
throughput (Mbps)	0.00676133	0.200635757	0.80314204	1.80731867	3.21316587	5.02068369	7.229872133	9.84073119	12.8532609
C/N for entire link	-2.799E+01	-1.327E+01	-7.246E+00	-3.724E+00	-1.225E+00	7.134E-01	2.297E+00	3.636E+00	4.796E+00
r	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01
Shannon's Limit (Mbps)	0.194	5.644	21.180	43.367	68.922	95.486	121.671	146.780	170.524
Practical achieveable throughput (Mbps)	60.714	60.714	60.714	60.714	60.714	60.714	60.714	60.714	60.714


Disadvantaged User to Disadvantaged User Throughput Based on Antenna Gain and Bandwidth
Throughput (Mbps)
0
20
40
60
80
100
120
140
160
180
0.711
5
10
15
20
25
30
35
40
Diameter of Spacecraft Antenna (meters)
Throughput Based on C/No and Eb/No
Shannon's Limit
Throughput Constrained by Bandwidth, Modulation, and Roll-Off Factor

Thesis Antenna Spreadsheet
shore to disadvantaged user link

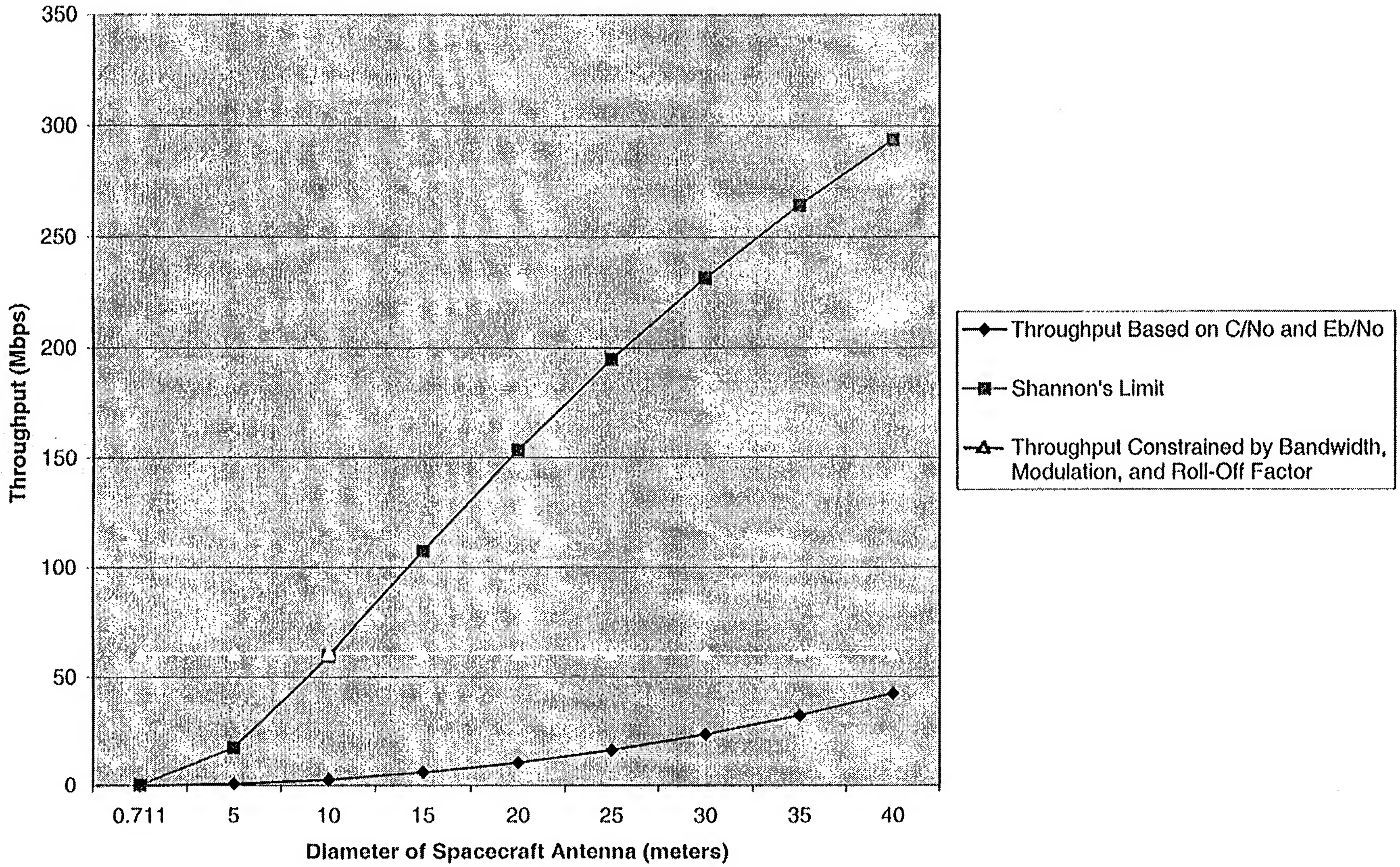
uplink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of ground antenna (m)	18.29	18.29	18.29	18.29	18.29	18.29	18.29	18.29	18.29
transmitted power (dBW)	40	40	40	40	40	40	40	40	40
frequency (Hz)	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09
wavelength (m)	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02
EIRPof ground antenna (dBW)	97	97	97	97	97	97	97	97	97
diameter of satellite antenna (m)	1.14	5	10	15	20	25	30	35	40
satellite antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
gain of spacecraft antenna (dB)	37.427882	50.269185	56.289785	59.811610	62.310385	64.248585	65.832210	67.171146	68.330985
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of spacecraft (dB)	37.427882	50.0314116	56.0520115	59.57383669	62.07261142	64.0108117	65.5944366	66.9333724	68.0932113
bandwidth (Hz)	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07
free space path loss (dB)	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on satellite	2710	2710	2710	2710	2710	2710	2710	2710	2710
No (dB)	-194.2703071	-194.270307	-194.270307	-194.2703071	-194.2703071	-194.27031	-194.2703071	-194.270307	-194.270307
received power (C) (dBW)	-72.574717	-59.930626	-53.908384	-50.386255	-47.887374	-45.949125	-44.365473	-43.026521	-41.866672
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	1.217E+02	1.343E+02	1.404E+02	1.439E+02	1.464E+02	1.483E+02	1.499E+02	1.512E+02	1.524E+02
N (dB)	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02
C/N (dB)	4.240E+01	5.505E+01	6.107E+01	6.459E+01	6.709E+01	6.903E+01	7.061E+01	7.195E+01	7.311E+01
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	2.193E+00	5.000E-01	2.500E-01	1.667E-01	1.250E-01	1.000E-01	8.333E-02	7.143E-02	6.250E-02
lambda (fo) (deg)	12.46016784	2.80721914	1.40293648	0.935207998	0.70138422	0.56109931	0.467579111	0.40078021	0.35068161
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	35962.56448	35795.0167	35788.2526	35787.00101	35786.56304	35786.3603	35786.25023	35786.1838	35786.1408
Lf (km)	1387.06019	312.498352	156.174248	104.1069269	78.07777088	62.4613191	52.05069295	44.6146697	39.0377167
Wf (km)	1.387E+03	3.125E+02	1.562E+02	1.041E+02	7.808E+01	6.246E+01	5.205E+01	4.461E+01	3.904E+01
Fa (km^2)	1.511E+06	7.670E+04	1.916E+04	8.512E+03	4.788E+03	3.064E+03	2.128E+03	1.563E+03	1.197E+03

DSCS III antenna diameter
= .7112 m
DSCS III SLEP parameter

DSCS III S mm
0

downlink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of satellite antenna (m)	0.711	5	10	15	20	25	30	35	40
transmitted power (dBW)	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99
line losses of transmitter (dB)	1	1	1	1	1	1	1	1	1
frequency (Hz)	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09
wavelength (m)	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02
antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
ideal gain of satellite antenna (dB)	27.086669	44.028677	50.049277	53.571103	56.069877	58.008078	59.591702	60.930638	62.090477
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of satellite (dB)	27.08666939	43.9721691	49.992769	53.51459421	56.01336894	57.9515692	59.53519412	60.8741299	62.0339689
EIRPof spacecraft (dBW)	33.07666939	49.9621691	55.982769	59.50459421	62.00336894	63.9415692	65.52519412	66.8641299	68.0239689
diameter of disadvantaged user antenna (m)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
gain of ship antenna (dB)	18.008078	18.008078	18.008078	18.008078	18.008078	18.008078	18.008078	18.008078	18.008078
bandwidth (Hz)	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07
free space path loss (dB)	1.963E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on ship	290	290	290	290	290	290	290	290	290
No (dB)	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602
received power (C) (dBW)	-150.218187	-132.758327	-126.730797	-123.207692	-120.708470	-118.770063	-117.186325	-115.847322	-114.687439
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	5.376E+01	7.122E+01	7.725E+01	8.077E+01	8.327E+01	8.521E+01	8.679E+01	8.813E+01	8.929E+01
N (dB)	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02
C/N (dB)	-2.554E+01	-8.076E+00	-2.049E+00	1.474E+00	3.973E+00	5.912E+00	7.496E+00	8.835E+00	9.994E+00
C/No for entire link (dB)	5.376E+01	7.122E+01	7.725E+01	8.077E+01	8.327E+01	8.521E+01	8.679E+01	8.813E+01	8.929E+01
Eb/No (dB)	10	10	10	10	10	10	10	10	10
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	7.213E+00	1.026E+00	5.128E-01	3.419E-01	2.564E-01	2.051E-01	1.709E-01	1.465E-01	1.282E-01
lambda (fo) (deg)	48.88699612	5.77027929	2.87929486	1.91881237	1.438921148	1.15106729	0.959191226	0.82214762	0.71936992
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	38273.0255	35824.0569	35795.4855	35790.21344	35788.3696	35787.5164	35787.05301	35786.7736	35786.5923
Lf (km)	5442.078066	642.344853	320.521787	213.6013162	160.1800446	128.136284	106.776729	91.5210977	80.079931
Wf (km)	5.442E+03	6.423E+02	3.205E+02	2.136E+02	1.602E+02	1.281E+02	1.068E+02	9.152E+01	8.008E+01
Fa (km^2)	2.326E+07	3.241E+05	8.069E+04	3.583E+04	2.015E+04	1.290E+04	8.954E+03	6.578E+03	5.036E+03
modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
throughput (Mbps)	0.011906476	0.66339029	2.65779892	5.981809483	10.63542377	16.618642	23.93146425	32.5738905	42.5459208
C/N for entire link	-2.554E+01	-8.076E+00	-2.049E+00	1.474E+00	3.973E+00	5.912E+00	7.496E+00	8.835E+00	9.994E+00
r	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01
Shannon's Limit (Mbps)	0.342	17.748	59.453	107.570	153.503	194.912	231.736	264.527	293.908
Practical achieveable throughput (Mbps)	60.714	60.714	60.714	60.714	60.714	60.714	60.714	60.714	60.714

Shore to Disadavantaged User Throughputs Based on Antenna Gain and Bandwidth



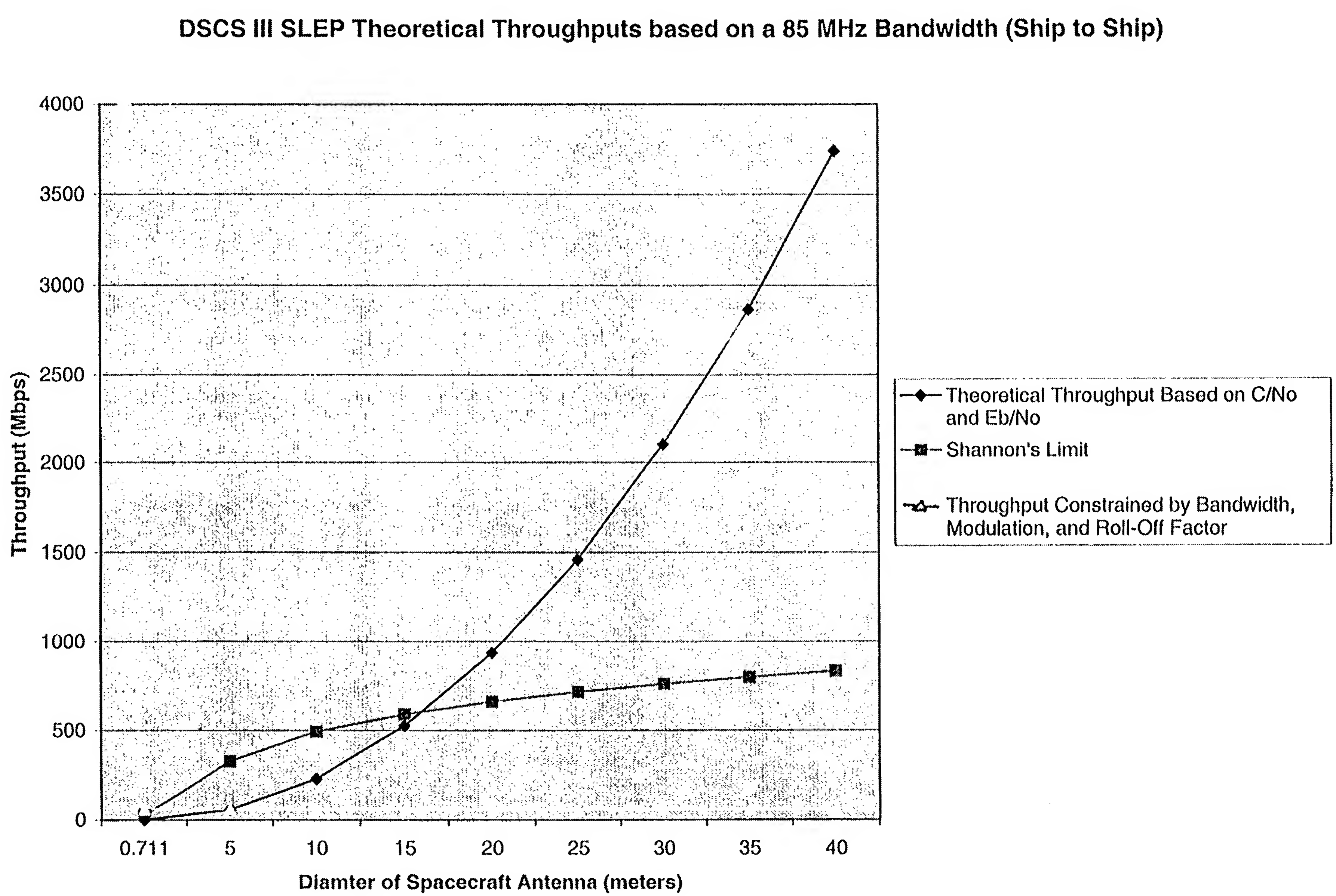
Thesis Antenna Spreadsheet
ship to ship link

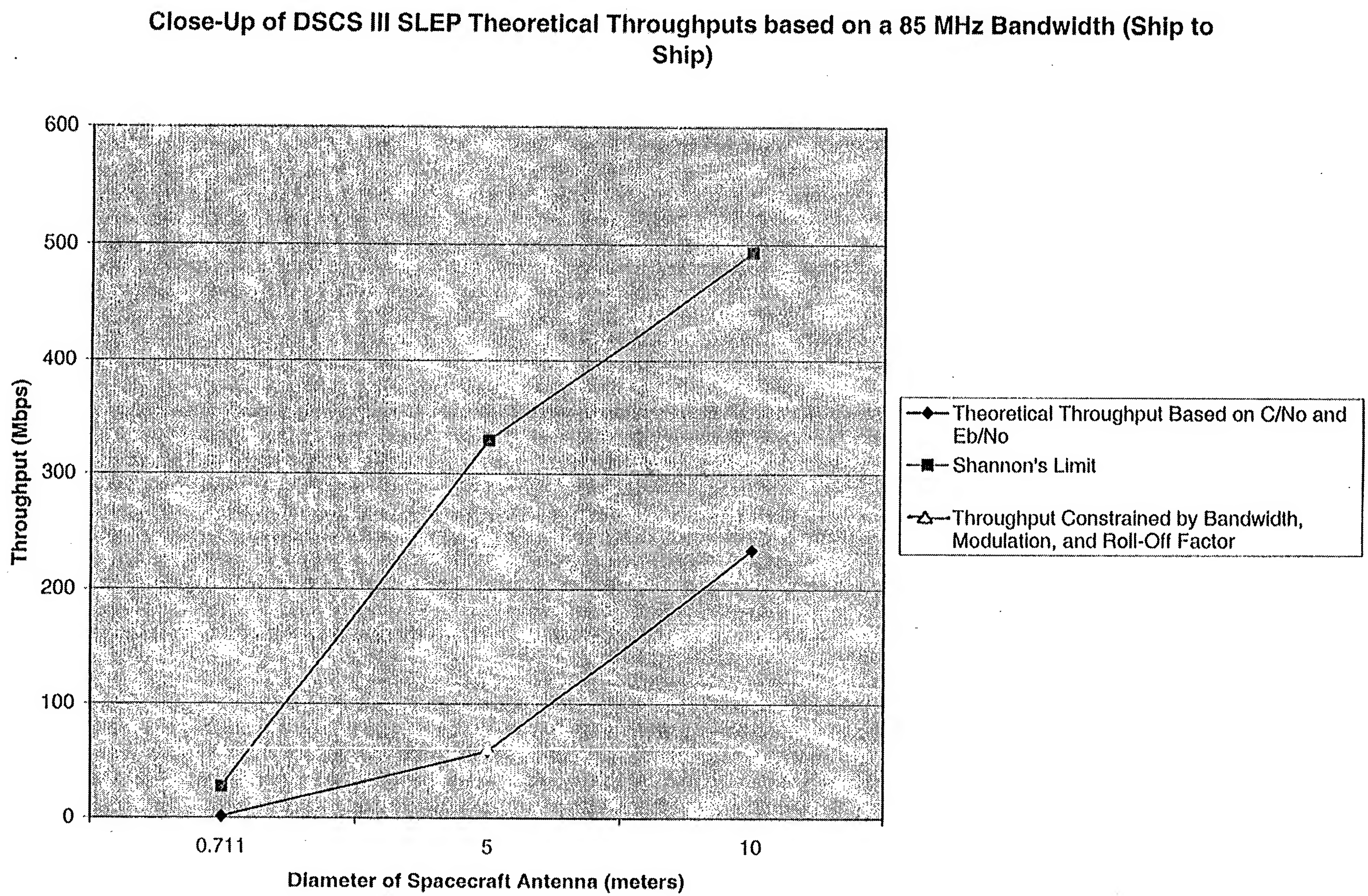
uplink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of ship antenna (m)	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36
transmitted power (dBW)	33.01	33.01	33.01	33.01	33.01	33.01	33.01	33.01	33.01
frequency (Hz)	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09
wavelength (m)	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02
EIRPof ship antenna (dBW)	72	72	72	72	72	72	72	72	72
diameter of satellite antenna (m)	1.14	5	10	15	20	25	30	35	40
satellite antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
gain of spacecraft antenna (dB)	37.427882	50.269185	56.289785	59.811610	62.310385	64.248585	65.832210	67.171146	68.330985
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of spacecraft (dB)	37.427882	50.03141159	56.05201151	59.5738367	62.0726114	64.0108117	65.5944366	66.9333724	68.09321133
bandwidth (Hz)	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07
free space path loss (dB)	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on satellite	2710	2710	2710	2710	2710	2710	2710	2710	2710
No (dB)	-194.2703071	-194.2703071	-194.270307	-194.270307	-194.270307	-194.270307	-194.270307	-194.270307	-194.270307
received power (C) (dBW)	-97.574717	-84.930626	-78.908384	-75.386255	-72.887374	-70.949125	-69.365473	-68.026521	-66.866672
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	9.670E+01	1.093E+02	1.154E+02	1.189E+02	1.214E+02	1.233E+02	1.249E+02	1.262E+02	1.274E+02
N (dB)	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02
C/N (dB)	1.740E+01	3.005E+01	3.607E+01	3.959E+01	4.209E+01	4.403E+01	4.561E+01	4.695E+01	4.811E+01
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	2.193E+00	5.000E-01	2.500E-01	1.667E-01	1.250E-01	1.000E-01	8.333E-02	7.143E-02	6.250E-02
lambda (fo) (deg)	12.46016784	2.807219145	1.402936478	0.935208	0.70138422	0.56109931	0.46757911	0.40078021	0.350681611
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	35962.56448	35795.01673	35788.25257	35787.001	35786.563	35786.3603	35786.2502	35786.1838	35786.14075
Lf (km)	1387.06019	312.4983523	156.1742476	104.106927	78.0777709	62.4613191	52.050693	44.6146697	39.03771673
Wf (km)	1.387E+03	3.125E+02	1.562E+02	1.041E+02	7.808E+01	6.246E+01	5.205E+01	4.461E+01	3.904E+01
Fa (km^2)	1.511E+06	7.670E+04	1.916E+04	8.512E+03	4.788E+03	3.064E+03	2.128E+03	1.563E+03	1.197E+03

DSCS III antenna diameter
= .7112 m
DSCS III SLEP parameter

DSCS III SLImm
38.709677

downlink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of satellite antenna (m)	0.711	5	10	15	20	25	30	35	40
transmitted power (dBW)	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99
line losses of transmitter (dB)	1	1	1	1	1	1	1	1	1
frequency (Hz)	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09
wavelength (m)	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02
antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
ideal gain of satellite antenna (dB)	27.086669	44.028677	50.049277	53.571103	56.069877	58.008078	59.591702	60.930638	62.090477
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of satellite (dB)	27.08666939	43.97216911	49.99276903	53.5145942	56.0133689	57.9515692	59.5351941	60.8741299	62.03396885
EIRPof spacecraft (dBW)	33.07666939	49.96216911	55.98276903	59.5045942	62.0033689	63.9415692	65.5251941	66.8641299	68.02396885
diameter of ship antenna (m)	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36
gain of ship antenna (dB)	37.507517	37.507517	37.507517	37.507517	37.507517	37.507517	37.507517	37.507517	37.507517
bandwidth (Hz)	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07
free space path loss (dB)	1.963E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on ship	290	290	290	290	290	290	290	290	290
No (dB)	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602
received power (C) (dBW)	-130.718747	-113.258887	-107.231357	-103.708252	-101.209030	-99.270623	-97.686885	-96.347882	-95.187999
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	7.326E+01	9.072E+01	9.674E+01	1.003E+02	1.028E+02	1.047E+02	1.063E+02	1.076E+02	1.088E+02
N (dB)	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02
C/N (dB)	-6.037E+00	1.142E+01	1.745E+01	2.097E+01	2.347E+01	2.541E+01	2.699E+01	2.833E+01	2.949E+01
C/No for entire link (dB)	7.324E+01	9.066E+01	9.669E+01	1.002E+02	1.027E+02	1.046E+02	1.062E+02	1.076E+02	1.087E+02
Eb/No (dB)	10	10	10	10	10	10	10	10	10
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	7.213E+00	1.026E+00	5.128E-01	3.419E-01	2.564E-01	2.051E-01	1.709E-01	1.465E-01	1.282E-01
lambda (fo) (deg)	48.88699612	5.770279287	2.879294855	1.91881237	1.43892115	1.15106729	0.95919123	0.82214762	0.719369923
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	38273.0255	35824.05692	35795.48552	35790.2134	35788.3696	35787.5164	35787.053	35786.7736	35786.59229
Lf (km)	5442.078066	642.3448532	320.5217875	213.601316	160.180045	128.136284	106.776729	91.5210977	80.07993104
Wf (km)	5.442E+03	6.423E+02	3.205E+02	2.136E+02	1.602E+02	1.281E+02	1.068E+02	9.152E+01	8.008E+01
Fa (km^2)	2.326E+07	3.241E+05	8.069E+04	3.583E+04	2.015E+04	1.290E+04	8.954E+03	6.578E+03	5.036E+03
modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
throughput (Mbps) (unlimited bandwidth)	1.056243516	58.31630551	233.6338915	525.829535	934.903392	1460.85548	2103.68581	2863.39438	3739.981183
C/N for entire link	-6.057E+00	1.136E+01	1.739E+01	2.091E+01	2.341E+01	2.535E+01	2.694E+01	2.827E+01	2.943E+01
r	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01
Shannon's Limit (Mbps)	27.162	329.516	493.280	591.533	661.670	716.203	760.813	798.556	831.264
Practical achieveable throughput (Mbps)	60.714	60.714	60.714	60.714	60.714	60.714	60.714	60.714	60.714


DSCS III SLEP Theoretical Throughputs based on a 85 MHz Bandwidth (Ship to Ship)
Throughput (Mbps)
0
500
1000
1500
2000
2500
3000
3500
4000
0.711
5
10
15
20
25
30
35
40
Diamter of Spacecraft Antenna (meters)
Theoretical Throughput Based on C/No and Eb/No
Shannon's Limit
Throughput Constrained by Bandwidth, Modulation, and Roll-Off Factor


Close-Up of DSCS III SLEP Theoretical Throughputs based on a 85 MHz Bandwidth (Ship to Ship)
Throughput (Mbps)
600
500
400
300
200
100
0
0.711
5
10
Diameter of Spacecraft Antenna (meters)
Theoretical Throughput Based on C/No and Eb/No
Shannon's Limit
Throughput Constrained by Bandwidth, Modulation, and Roll-Off Factor

Thesis Antenna Spreadsheet
ship to ship link

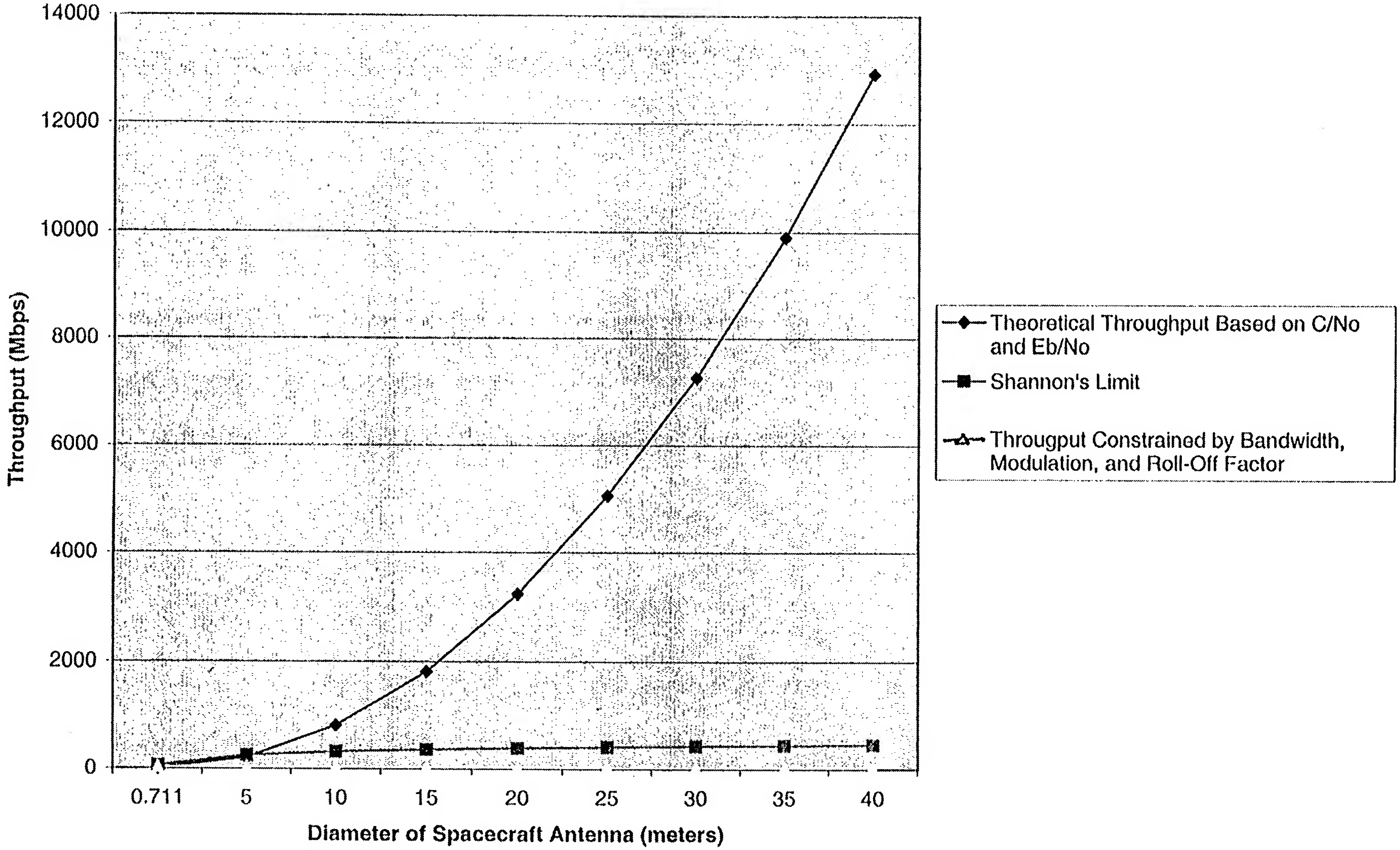
uplink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of ship antenna (m)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
transmitted power (dBW)	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02	26.02
frequency (Hz)	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09
wavelength (m)	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02
line losses of transmitter (dB)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
gain of ship antenna (dB)	42.445816	42.445816	42.445816	42.445816	42.445816	42.445816	42.445816	42.445816	42.445816
EIRPof ship antenna (dBW)	67.47	67.47	67.47	67.47	67.47	67.47	67.47	67.47	67.47
diameter of satellite antenna (m)	0.711	5	10	15	20	25	30	35	40
satellite and ship antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
gain of spacecraft antenna (dB)	30.855933	47.797941	53.818541	57.340366	59.839141	61.777341	63.360966	64.699902	65.859741
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of spacecraft (dB)	30.85593283	47.6633428	53.6839427	57.20576789	59.7045426	61.6427429	63.2263678	64.56530359	65.7251425
bandwidth (Hz)	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07
free space path loss (dB)	1.997E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on satellite	3853	3853	3853	3853	3853	3853	3853	3853	3853
No (dB)	-192.7420099	-192.74201	-192.74201	-192.7420099	-192.74201	-192.74201	-192.74201	-192.74201	-192.74201
received power (C) (dBW)	-106.374086	-89.363314	-83.339812	-79.817450	-77.318487	-75.380200	-73.796528	-72.457564	-71.297706
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	8.637E+01	1.034E+02	1.094E+02	1.129E+02	1.154E+02	1.174E+02	1.189E+02	1.203E+02	1.214E+02
N (dB)	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02
C/N (dB)	1.080E+01	2.782E+01	3.384E+01	3.736E+01	3.986E+01	4.180E+01	4.338E+01	4.472E+01	4.588E+01
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	4.673E+00	6.646E-01	3.323E-01	2.215E-01	1.661E-01	1.329E-01	1.108E-01	9.494E-02	8.307E-02
lambda (fo) (deg)	27.91661303	3.73294692	1.86489081	1.243065606	0.93224806	0.74577951	0.62147436	0.532687878	0.46609938
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	36650.05792	35801.9401	35789.98	35787.76847	35786.9947	35786.6366	35786.4421	35786.32477	35786.2487
Lf (km)	3107.664604	415.549945	207.598792	138.3774952	103.777428	83.0198347	69.1822416	59.29857114	51.8859698
Wf (km)	3.108E+03	4.155E+02	2.076E+02	1.384E+02	1.038E+02	8.302E+01	6.918E+01	5.930E+01	5.188E+01
Fa (km^2)	7.585E+06	1.356E+05	3.385E+04	1.504E+04	8.458E+03	5.413E+03	3.759E+03	2.762E+03	2.114E+03

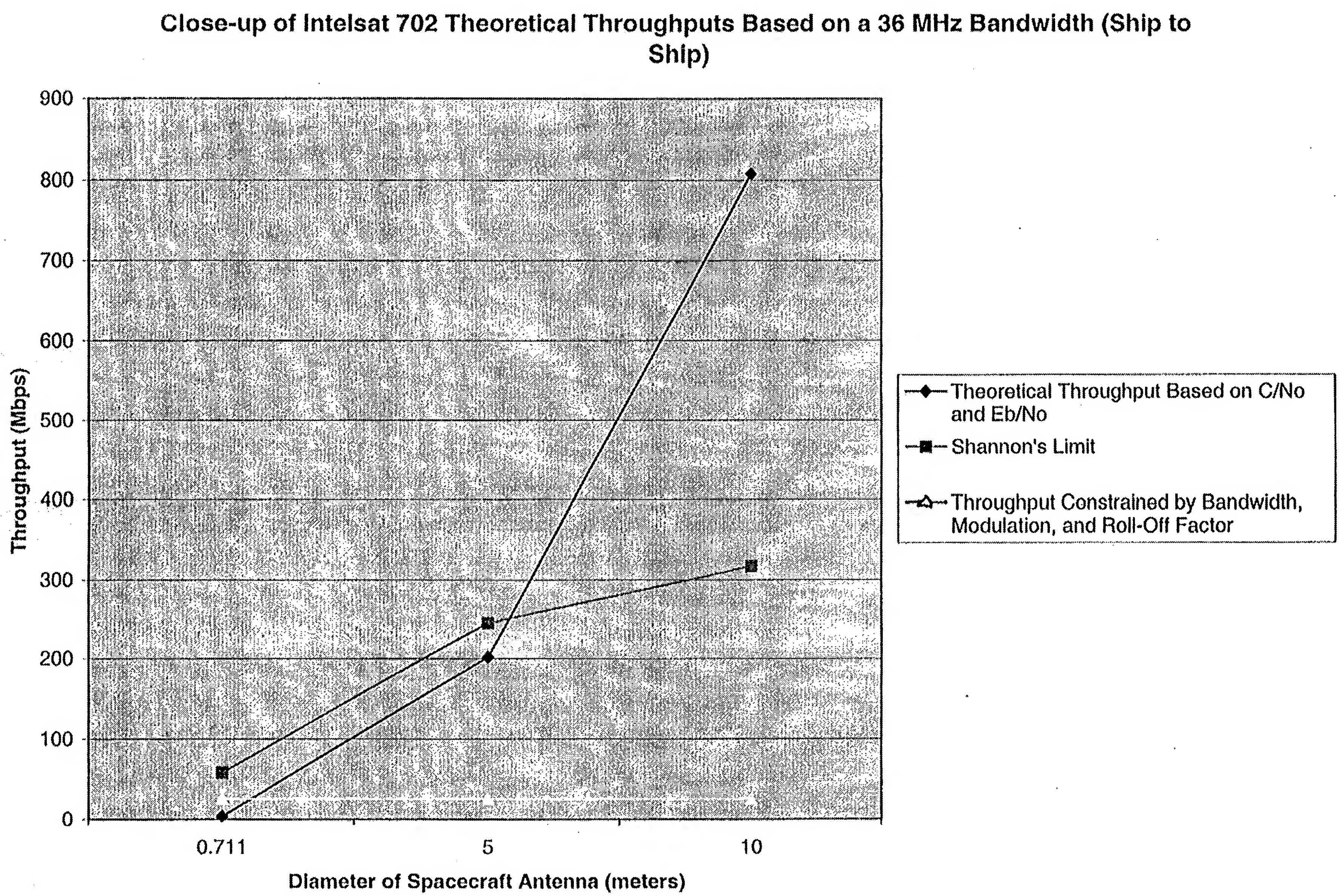
Intelsat 702 antenna diameter
= .7112 m
Intelsat 702 parameter

73.26007 mm

downlink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of satellite antenna (m)	0.711	5	10	15	20	25	30	35	40
transmitted power (dBW)	12.04	12.04	12.04	12.04	12.04	12.04	12.04	12.04	12.04
line losses of transmitter (dB)	1	1	1	1	1	1	1	1	1
frequency (Hz)	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09
wavelength (m)	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02
antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
ideal gain of satellite antenna (dB)	27.086669	44.028677	50.049277	53.571103	56.069877	58.008078	59.591702	60.930638	62.090477
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of satellite (dB)	27.08666939	43.9721691	49.992769	53.51459421	56.0133689	57.9515692	59.5351941	60.87412991	62.0339689
EIRPof spacecraft (dBW)	38.12666939	55.0121691	61.032769	64.55459421	67.0533689	68.9915692	70.5751941	71.91412991	73.0739689
diameter of ship antenna (m)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
gain of ship antenna (dB)	38.676553	38.676553	38.676553	38.676553	38.676553	38.676553	38.676553	38.676553	38.676553
bandwidth (Hz)	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07
free space path loss (dB)	1.963E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on ship	290	290	290	290	290	290	290	290	290
No (dB)	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602
received power (C) (dBW)	-124.499712	-107.039852	-101.012322	-97.489217	-94.989995	-93.051587	-91.467850	-90.128846	-88.968964
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	7.948E+01	9.694E+01	1.030E+02	1.065E+02	1.090E+02	1.109E+02	1.125E+02	1.138E+02	1.150E+02
N (dB)	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02
C/N (dB)	3.913E+00	2.137E+01	2.740E+01	3.092E+01	3.342E+01	3.536E+01	3.695E+01	3.828E+01	3.944E+01
C/No for entire link (dB)	7.867E+01	9.605E+01	1.021E+02	1.056E+02	1.081E+02	1.100E+02	1.116E+02	1.130E+02	1.141E+02
Eb/No (dB)	10	10	10	10	10	10	10	10	10
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	7.213E+00	1.026E+00	5.128E-01	3.419E-01	2.564E-01	2.051E-01	1.709E-01	1.465E-01	1.282E-01
lambda (fo) (deg)	48.88699612	5.77027929	2.87929486	1.91881237	1.43892115	1.15106729	0.95919123	0.822147623	0.71936992
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	38273.0255	35824.0569	35795.4855	35790.21344	35788.3696	35787.5164	35787.053	35786.77362	35786.5923
Lf (km)	5442.078066	642.344853	320.521787	213.6013162	160.180045	128.136284	106.776729	91.52109769	80.079931
Wf (km)	5.442E+03	6.423E+02	3.205E+02	2.136E+02	1.602E+02	1.281E+02	1.068E+02	9.152E+01	8.008E+01
Fa (km^2)	2.326E+07	3.241E+05	8.069E+04	3.583E+04	2.015E+04	1.290E+04	8.954E+03	6.578E+03	5.036E+03
modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
throughput (Mbps)	3.688071766	201.754767	808.169216	1818.85893	3233.82439	5053.06567	7276.58277	9904.375696	12936.4445
C/N for entire link	3.105E+00	2.049E+01	2.651E+01	3.003E+01	3.253E+01	3.447E+01	3.606E+01	3.740E+01	3.856E+01
r	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01
Shannon's Limit (Mbps)	57.816	245.444	317.171	359.238	389.103	412.273	431.207	447.217	461.086
Practical achieveable throughput (Mbps)	25.714	25.714	25.714	25.714	25.714	25.714	25.714	25.714	25.714

Intelsat 702 Theoretical Throughputs based on a 36MHz Bandwidth (Ship to Ship)




Close-up of Intelsat 702 Theoretical Throughputs Based on a 36 MHz Bandwidth (Ship to Ship)
Throughput (Mbps)
900
800
700
600
500
400
300
200
100
0
0.711
5
10
Diameter of Spacecraft Antenna (meters)
Theoretical Throughput Based on C/No and Eb/No
Shannon's Limit
Throughput Constrained by Bandwidth, Modulation, and Roll-Off Factor

Thesis Antenna Spreadsheet
shore to ship link

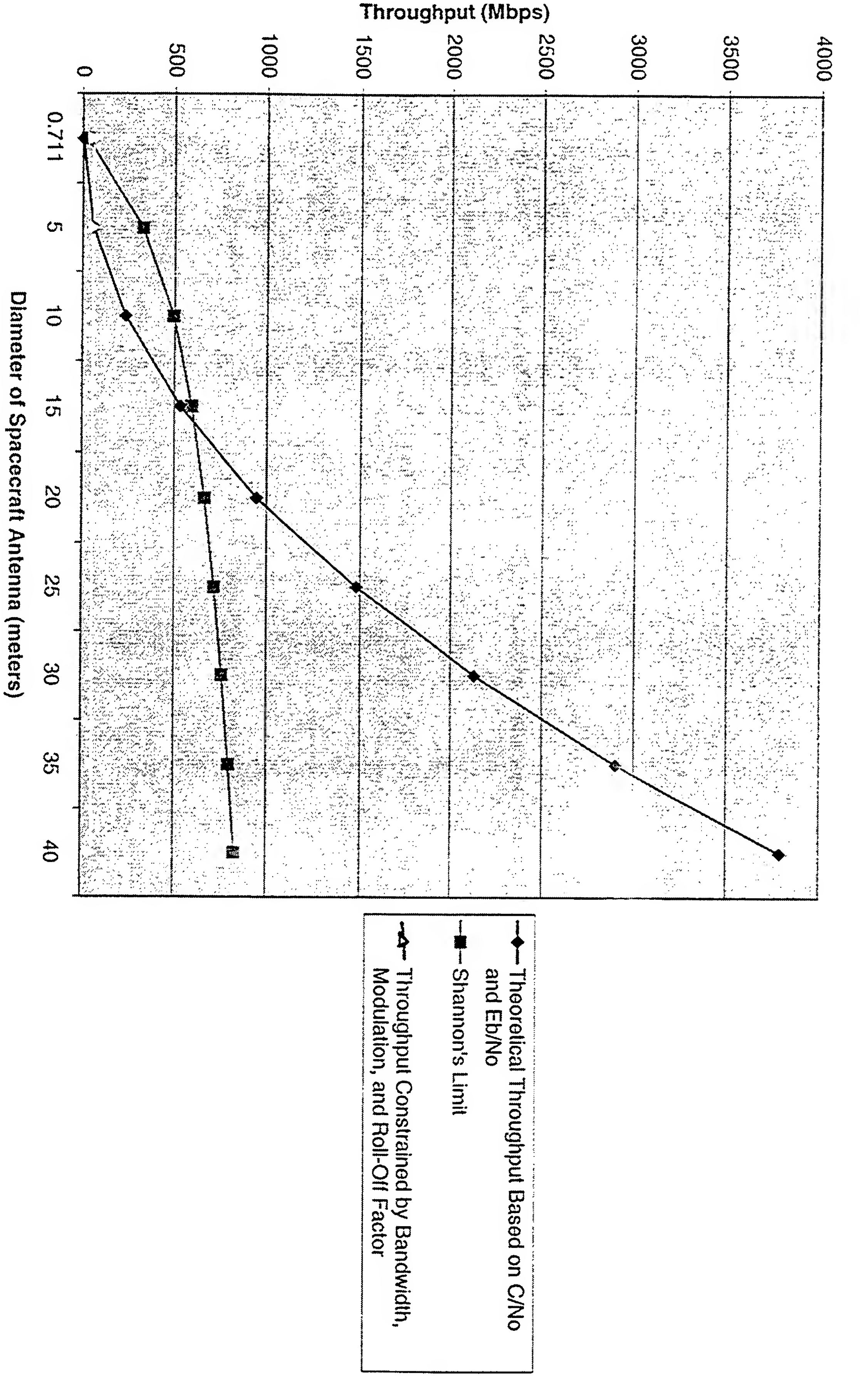
uplink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of ground antenna (m)	18.29	18.29	18.29	18.29	18.29	18.29	18.29	18.29	18.29
transmitted power (dBW)	40	40	40	40	40	40	40	40	40
frequency (Hz)	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09	8.400E+09
wavelength (m)	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02	3.57E-02
EIRPof ground antenna (dBW)	97	97	97	97	97	97	97	97	97
diameter of satellite antenna (m)	1.14	5	10	15	20	25	30	35	40
satellite antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
gain of spacecraft antenna (dB)	37.427882	50.269185	56.289785	59.811610	62.310385	64.248585	65.832210	67.171146	68.330985
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of spacecraft (dB)	37.427882	50.03141159	56.0520115	59.5738367	62.07261142	64.01081168	65.5944366	66.9333724	68.09321133
bandwidth (Hz)	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07
free space path loss (dB)	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02	2.020E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on satellite	2710	2710	2710	2710	2710	2710	2710	2710	2710
No (dB)	-194.270307	-194.2703071	-194.270307	-194.27031	-194.270307	-194.270307	-194.27031	-194.27031	-194.270307
received power (C) (dBW)	-72.574717	-59.930626	-53.908384	-50.386255	-47.887374	-45.949125	-44.365473	-43.026521	-41.866672
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	1.217E+02	1.343E+02	1.404E+02	1.439E+02	1.464E+02	1.483E+02	1.499E+02	1.512E+02	1.524E+02
N (dB)	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02	-1.150E+02
C/N (dB)	4.240E+01	5.505E+01	6.107E+01	6.459E+01	6.709E+01	6.903E+01	7.061E+01	7.195E+01	7.311E+01
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	2.193E+00	5.000E-01	2.500E-01	1.667E-01	1.250E-01	1.000E-01	8.333E-02	7.143E-02	6.250E-02
lambda (fo) (deg)	12.4601678	2.807219145	1.40293648	0.935208	0.70138422	0.561099313	0.46757911	0.40078021	0.350681611
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	35962.5645	35795.01673	35788.2526	35787.001	35786.56304	35786.36034	35786.2502	35786.1838	35786.14075
Lf (km)	1387.06019	312.4983523	156.174248	104.106927	78.07777088	62.4613191	52.050693	44.6146697	39.03771673
Wf (km)	1.387E+03	3.125E+02	1.562E+02	1.041E+02	7.808E+01	6.246E+01	5.205E+01	4.461E+01	3.904E+01
Fa (km^2)	1.511E+06	7.670E+04	1.916E+04	8.512E+03	4.788E+03	3.064E+03	2.128E+03	1.563E+03	1.197E+03

DSCS III antenna diameter
= .7112 m
DSCS III SLEP parameter

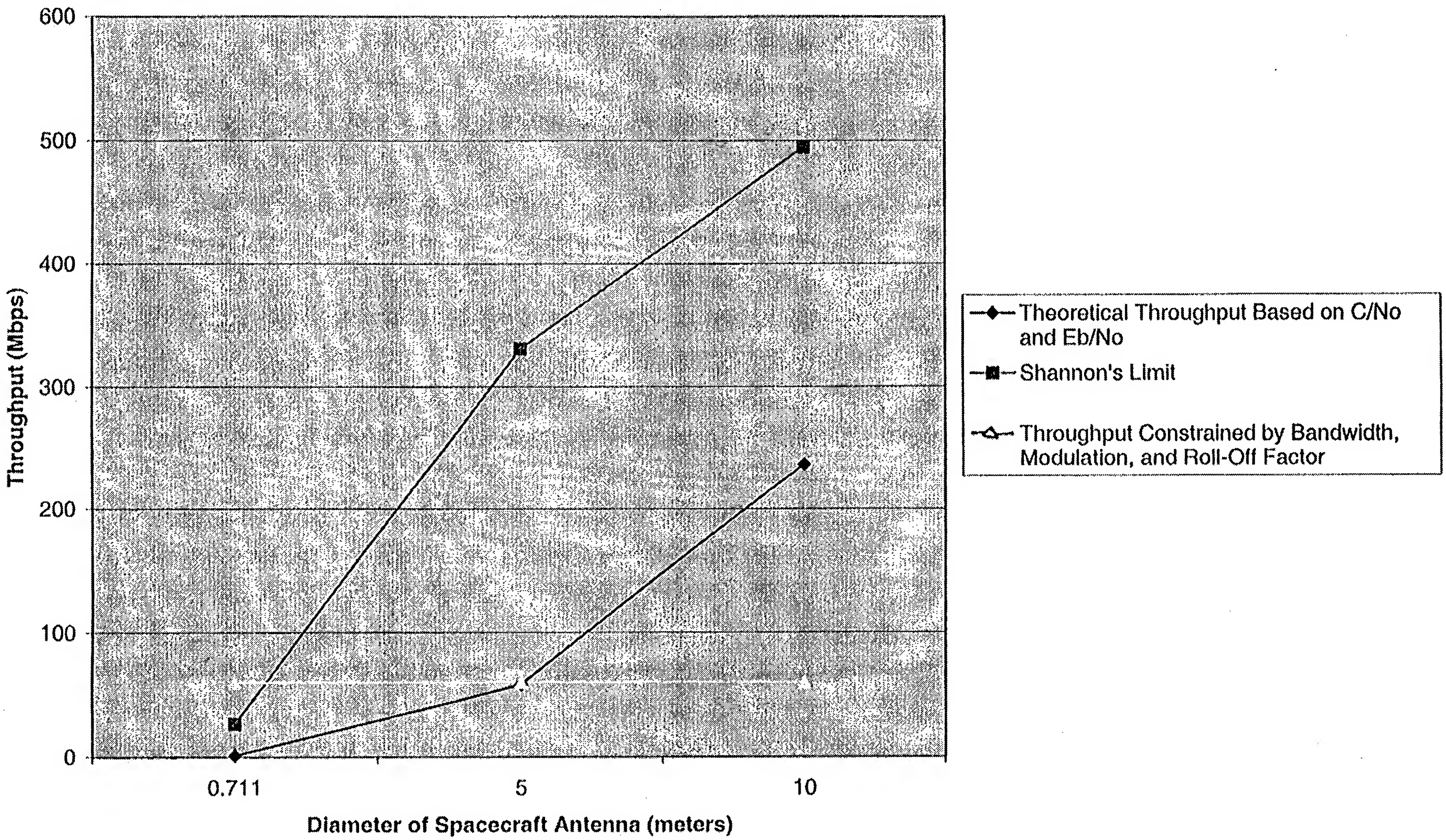
DSCS III S mm
0

downlink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of satellite antenna (m)	0.711	5	10	15	20	25	30	35	40
transmitted power (dBW)	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99	6.99
line losses of transmitter (dB)	1	1	1	1	1	1	1	1	1
frequency (Hz)	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09
wavelength (m)	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02
antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
ideal gain of satellite antenna (dB)	27.086669	44.028677	50.049277	53.571103	56.069877	58.008078	59.591702	60.930638	62.090477
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of satellite (dB)	27.0866694	43.97216911	49.992769	53.5145942	56.01336894	57.9515692	59.5351941	60.8741299	62.03396885
EIRPof spacecraft (dBW)	33.0766694	49.96216911	55.982769	59.5045942	62.00336894	63.9415692	65.5251941	66.8641299	68.02396885
diameter of ship antenna (m)	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36	2.36
gain of ship antenna (dB)	37.507517	37.507517	37.507517	37.507517	37.507517	37.507517	37.507517	37.507517	37.507517
bandwidth (Hz)	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07	8.50E+07
free space path loss (dB)	1.963E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on ship	290	290	290	290	290	290	290	290	290
No (dB)	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602
received power (C) (dBW)	-130.718747	-113.258887	-107.231357	-103.708252	-101.209030	-99.270623	-97.686885	-96.347882	-95.187999
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	7.326E+01	9.072E+01	9.674E+01	1.003E+02	1.028E+02	1.047E+02	1.063E+02	1.076E+02	1.088E+02
N (dB)	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02	-1.247E+02
C/N (dB)	-6.037E+00	1.142E+01	1.745E+01	2.097E+01	2.347E+01	2.541E+01	2.699E+01	2.833E+01	2.949E+01
C/No for entire link (dB)	7.326E+01	9.072E+01	9.674E+01	1.003E+02	1.028E+02	1.047E+02	1.063E+02	1.076E+02	1.088E+02
Eb/No (dB)	10	10	10	10	10	10	10	10	10
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	7.213E+00	1.026E+00	5.128E-01	3.419E-01	2.564E-01	2.051E-01	1.709E-01	1.465E-01	1.282E-01
lambda (fo) (deg)	48.8869961	5.770279287	2.87929486	1.91881237	1.438921148	1.151067287	0.95919123	0.82214762	0.719369923
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	38273.0255	35824.05692	35795.4855	35790.2134	35788.3696	35787.51641	35787.053	35786.7736	35786.59229
Lf (km)	5442.07807	642.3448532	320.521787	213.601316	160.1800446	128.1362844	106.776729	91.5210977	80.07993104
Wf (km)	5.442E+03	6.423E+02	3.205E+02	2.136E+02	1.602E+02	1.281E+02	1.068E+02	9.152E+01	8.008E+01
Fa (km^2)	2.326E+07	3.241E+05	8.069E+04	3.583E+04	2.015E+04	1.290E+04	8.954E+03	6.578E+03	5.036E+03
modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
throughput (Mbps)	1.06101387	59.11455888	236.835848	533.037657	947.7201446	1480.883331	2132.52722	2902.65182	3791.257117
C/N for entire link	-6.037E+00	1.142E+01	1.745E+01	2.097E+01	2.347E+01	2.541E+01	2.699E+01	2.833E+01	2.949E+01
r	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01
Shannon's Limit (Mbps)	27.272	331.071	494.919	593.189	663.332	717.868	762.479	800.223	832.932
Practical achieveable throughput (Mbps)	60.714	60.714	60.714	60.714	60.714	60.714	60.714	60.714	60.714

DSCS III SLEP Theoretical Throughputs Based on a 85 MHz Bandwidth (Shore to Ship)



Close-Up of DSCS III SLEP Theoretical Throughputs based on a 85 MHz Bandwidth (Shore to Ship)



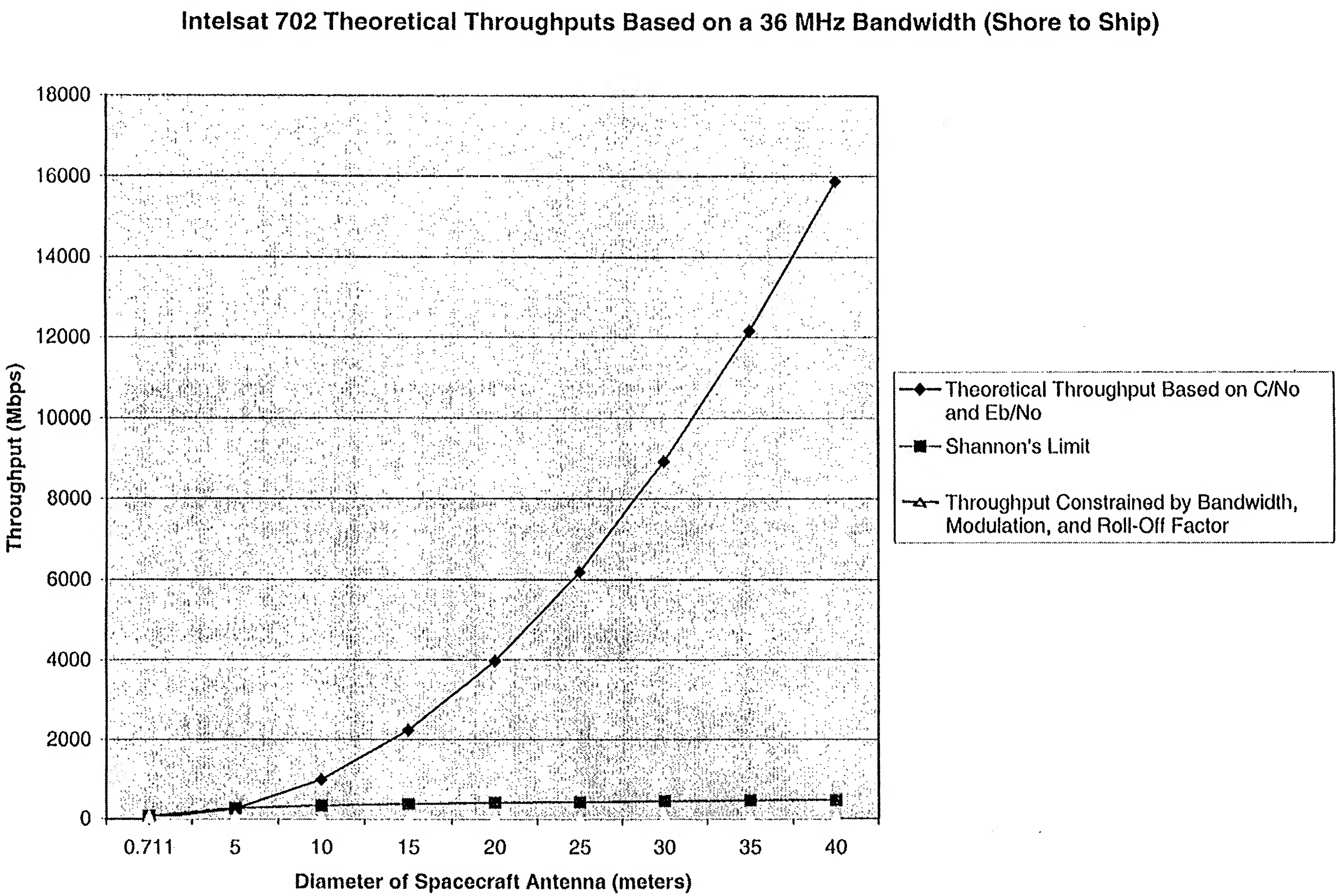
Thesis Antenna Spreadsheet
shore to ship link

uplink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of ground antenna (m)	18.29	18.29	18.29	18.29	18.29	18.29	18.29	18.29	18.29
transmitted power (dBW)	40	40	40	40	40	40	40	40	40
frequency (Hz)	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09	6.320E+09
wavelength (m)	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02	4.75E-02
gain of ground antenna (dB)	59.062815	59.062815	59.062815	59.062815	59.062815	59.062815	59.062815	59.062815	59.062815
EIRPof ground antenna (dBW)	97.00	97.00	97.00	97.00	97.00	97.00	97.00	97.00	97.00
diameter of satellite antenna (m)	0.711	5	10	15	20	25	30	35	40
satellite antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
gain of spacecraft antenna (dB)	30.855933	47.797941	53.818541	57.340366	59.839141	61.777341	63.360966	64.699902	65.859741
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of spacecraft (dB)	30.8559328	47.6633428	53.6839427	57.2057679	59.7045426	61.6427429	63.2263678	64.56530359	65.7251425
bandwidth (Hz)	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07
free space path loss (dB)	1.997E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02	1.995E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on satellite	3853	3853	3853	3853	3853	3853	3853	3853	3853
No (dB)	-192.74201	-192.74201	-192.74201	-192.74201	-192.74201	-192.74201	-192.74201	-192.74201	-192.74201
received power (C) (dBW)	-76.839902	-59.829130	-53.805628	-50.283266	-47.784304	-45.846016	-44.262344	-42.923380	-41.763523
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	1.159E+02	1.329E+02	1.389E+02	1.425E+02	1.450E+02	1.469E+02	1.485E+02	1.498E+02	1.510E+02
N (dB)	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02	-1.172E+02
C/N (dB)	4.034E+01	5.735E+01	6.337E+01	6.690E+01	6.939E+01	7.133E+01	7.292E+01	7.426E+01	7.542E+01
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	4.673E+00	6.646E-01	3.323E-01	2.215E-01	1.661E-01	1.329E-01	1.108E-01	9.494E-02	8.307E-02
lambda (fo) (deg)	27.916613	3.73294692	1.86489081	1.24306561	0.93224806	0.74577951	0.62147436	0.532687878	0.46609938
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	36650.0579	35801.9401	35789.98	35787.7685	35786.9947	35786.6366	35786.4421	35786.32477	35786.2487
Lf (km)	3107.6646	415.549945	207.598792	138.377495	103.777428	83.0198347	69.1822416	59.29857114	51.8859698
Wf (km)	3.108E+03	4.155E+02	2.076E+02	1.384E+02	1.038E+02	8.302E+01	6.918E+01	5.930E+01	5.188E+01
Fa (km^2)	7.585E+06	1.356E+05	3.385E+04	1.504E+04	8.458E+03	5.413E+03	3.759E+03	2.762E+03	2.114E+03

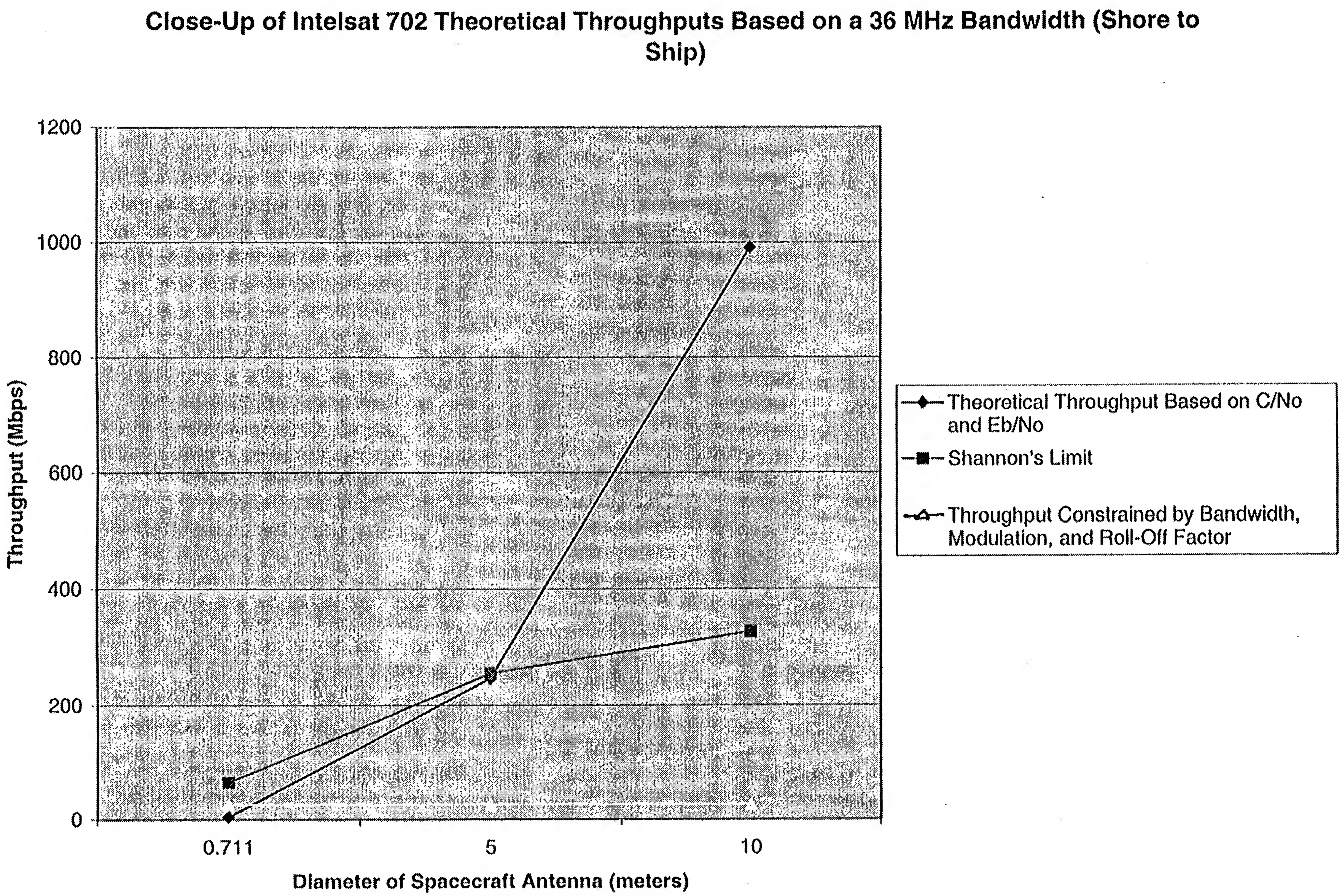
Intelsat 702 antenna diameter
= .7112 m
Intelsat 702 parameter

73.26007 mm

downlink									
altitude of satellite (km)	35786	35786	35786	35786	35786	35786	35786	35786	35786
diameter of satellite antenna (m)	0.711	5	10	15	20	25	30	35	40
transmitted power (dBW)	12.04	12.04	12.04	12.04	12.04	12.04	12.04	12.04	12.04
line losses of transmitter (dB)	1	1	1	1	1	1	1	1	1
frequency (Hz)	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09	4.095E+09
wavelength (m)	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02	7.33E-02
antenna efficiency	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
ideal gain of satellite antenna (dB)	27.086669	44.028677	50.049277	53.571103	56.069877	58.008078	59.591702	60.930638	62.090477
rms surface error (m)	0.00E+00	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
degraded (actual) gain of satellite (dB)	27.0866694	43.9721691	49.992769	53.5145942	56.0133689	57.9515692	59.5351941	60.87412991	62.0339689
EIRPof spacecraft (dBW)	38.1266694	55.0121691	61.032769	64.5545942	67.0533689	68.9915692	70.5751941	71.91412991	73.0739689
diameter of ship antenna (m)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
gain of ship antenna (dB)	38.676553	38.676553	38.676553	38.676553	38.676553	38.676553	38.676553	38.676553	38.676553
bandwidth (Hz)	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07	3.60E+07
free space path loss (dB)	1.963E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02	1.957E+02
atmospheric attenuation (dB)	3	3	3	3	3	3	3	3	3
line losses of receiver (dB)	2	2	2	2	2	2	2	2	2
equivalent temperature (K) on ship	290	290	290	290	290	290	290	290	290
No (dB)	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602	-203.97602
received power (C) (dBW)	-124.499712	-107.039852	-101.012322	-97.489217	-94.989995	-93.051587	-91.467850	-90.128846	-88.968964
required margin (dB)	3	3	3	3	3	3	3	3	3
C/No (dB)	7.948E+01	9.694E+01	1.030E+02	1.065E+02	1.090E+02	1.109E+02	1.125E+02	1.138E+02	1.150E+02
N (dB)	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02	-1.284E+02
C/N (dB)	3.913E+00	2.137E+01	2.740E+01	3.092E+01	3.342E+01	3.536E+01	3.695E+01	3.828E+01	3.944E+01
C/No for entire link (dB)	7.948E+01	9.694E+01	1.030E+02	1.065E+02	1.090E+02	1.109E+02	1.125E+02	1.138E+02	1.150E+02
Eb/No (dB)	10	10	10	10	10	10	10	10	10
spacecraft-centered nadir angle (deg)	0	0	0	0	0	0	0	0	0
beamwidth (deg)	7.213E+00	1.026E+00	5.128E-01	3.419E-01	2.564E-01	2.051E-01	1.709E-01	1.465E-01	1.282E-01
lambda (fo) (deg)	48.8869961	5.77027929	2.87929486	1.91881237	1.43892115	1.15106729	0.95919123	0.822147623	0.71936992
lambda (fi) (deg)	0	0	0	0	0	0	0	0	0
slant range (km)	38273.0255	35824.0569	35795.4855	35790.2134	35788.3696	35787.5164	35787.053	35786.77362	35786.5923
Lf (km)	5442.07807	642.344853	320.521787	213.601316	160.180045	128.136284	106.776729	91.52109769	80.079931
Wf (km)	5.442E+03	6.423E+02	3.205E+02	2.136E+02	1.602E+02	1.281E+02	1.068E+02	9.152E+01	8.008E+01
Fa (km^2)	2.326E+07	3.241E+05	8.069E+04	3.583E+04	2.015E+04	1.290E+04	8.954E+03	6.578E+03	5.036E+03
modulation	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK	BPSK
throughput (Mbps)	4.44152299	247.461233	991.425487	2231.36449	3967.2789	6199.16881	8927.03424	12150.87519	15870.6917
C/N for entire link	3.912E+00	2.137E+01	2.740E+01	3.092E+01	3.342E+01	3.536E+01	3.694E+01	3.828E+01	3.944E+01
r	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01	4.000E-01
Shannon's Limit (Mbps)	64.493	255.964	327.764	369.844	399.714	422.887	441.822	457.832	471.702
Practical achieveable throughput (Mbps)	25.714	25.714	25.714	25.714	25.714	25.714	25.714	25.714	25.714



Intelsat 702 Theoretical Throughputs Based on a 36 MHz Bandwidth (Shore to Ship)
Throughput (Mbps)
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0.711
5
10
15
20
25
30
35
40
Diameter of Spacecraft Antenna (meters)
Theoretical Throughput Based on C/No and Eb/No
Shannon's Limit
Throughput Constrained by Bandwidth, Modulation, and Roll-Off Factor


Close-Up of Intelsat 702 Theoretical Throughputs Based on a 36 MHz Bandwidth (Shore to Ship)
Throughput (Mbps)
0
200
400
600
800
1000
1200
0.711
5
10
Diameter of Spacecraft Antenna (meters)
Theoretical Throughput Based on C/No and Eb/No
Shannon's Limit
Throughput Constrained by Bandwidth, Modulation, and Roll-Off Factor

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APPENDIX C. LABORATORY EXPERIMENTAL RESULTS AND GRAPHS OF THESE RESULTS

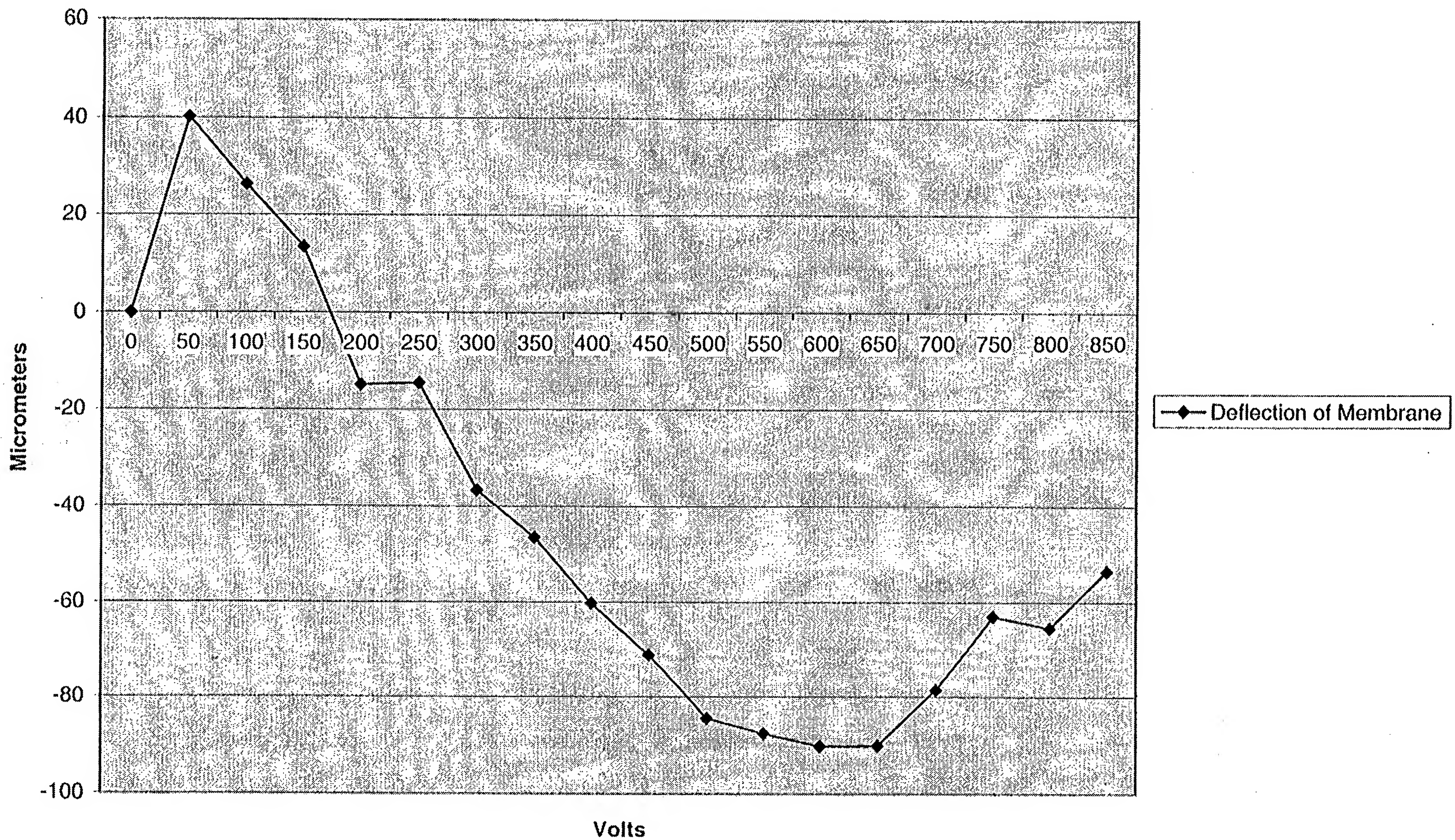
This appendix contains all of the raw data collected during the experiment conducted on the PVDF membrane. Data processing results are also displayed to the right of the raw data. The graphs that follow are based on this processed data.

Deflection of Membrane from Nominal Pressure Setting by Piezoelectric Effect
(positive values mean the membrane is bulging outward toward the laser)

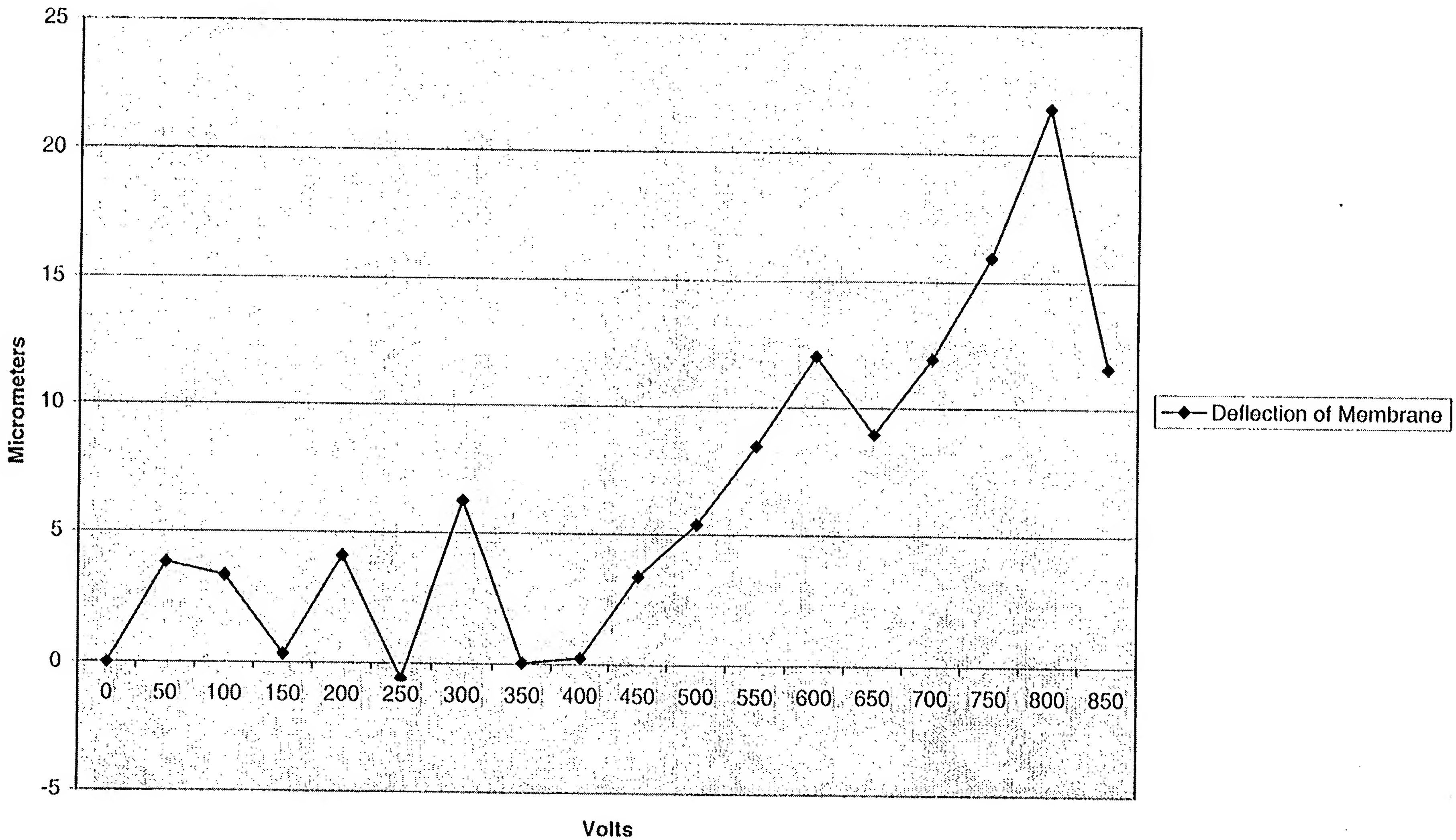
Volts	.1 psi - Positive Lead on Plus Sign micrometers	.1 psi - Negative Lead on Plus Sign micrometers	.3 psi - Positive Lead on Plus Sign micrometers	.3 psi - Negative Lead on Plus Sign micrometers
0	0	0	0	0
50	40.2301	26.2694	3.7946	-13.914
100	26.4153	46.6023	3.3081	-21.0658
150	13.4269	46.6023	0.3405	-11.822
200	-14.9357	45.1917	4.0865	-24.131
250	-14.5465	49.2289	-0.5838	-27.8773
300	-36.6837	60.2216	6.2757	-29.3855
350	-46.5122	69.9493	0.0486	-17.125
400	-60.2337	71.3598	0.2432	-0.973
450	-70.9876	88.8202	3.3568	7.8811
500	-84.5156	97.5743	5.4	8.4648
550	-87.6787	102.3889	8.4648	-3.6974
600	-90.2579	121.8899	12.0161	6.373
650	-90.1605	123.3488	8.9513	16.1511
700	-78.5301	132.88	11.9188	25.5884
750	-63.0073	132.1992	15.9565	45.0944
800	-65.343	137.9858	21.7454	43.1487
850	-53.5675	169.786	11.5783	45.2889

Volts	.5 psi - Positive Lead on Plus Sign micrometers	.5 psi - Negative Lead on Plus Sign micrometers	.7 psi - Positive Lead on Plus Sign micrometers	.7 psi - Negative Lead on Plus Sign micrometers
0	0	0	0	0
50	11.5783	11.3837	-6.3731	2.6757
100	13.9133	18.0969	0.6324	12.0647
150	12.5026	81.7194	7.7351	29.6259
200	8.4648	96.5043	10.508	40.3761
250	11.0918	116.2003	18.9726	29.6259
300	16.9781	146.7385	20.0428	51.2232
350	16.443	157.5817	20.8211	43.0514
400	25.1992	156.901	16.0538	64.7937
450	26.9018	160.9367	25.3451	71.3598
500	22.7183	165.1669	29.5286	73.8889
550	26.3667	164.4862	23.0588	85.7075
600	26.3667	170.3208	20.8211	99.4223
650	30.161	171.4877	12.989	102.4862
700	30.842	172.4116	19.459	115.8598
750	30.7933	170.8557	3.4541	127.8713
800	30.9879	177.5167	6.9081	137.6454
850	30.3069	183.6914	12.4539	151.3092

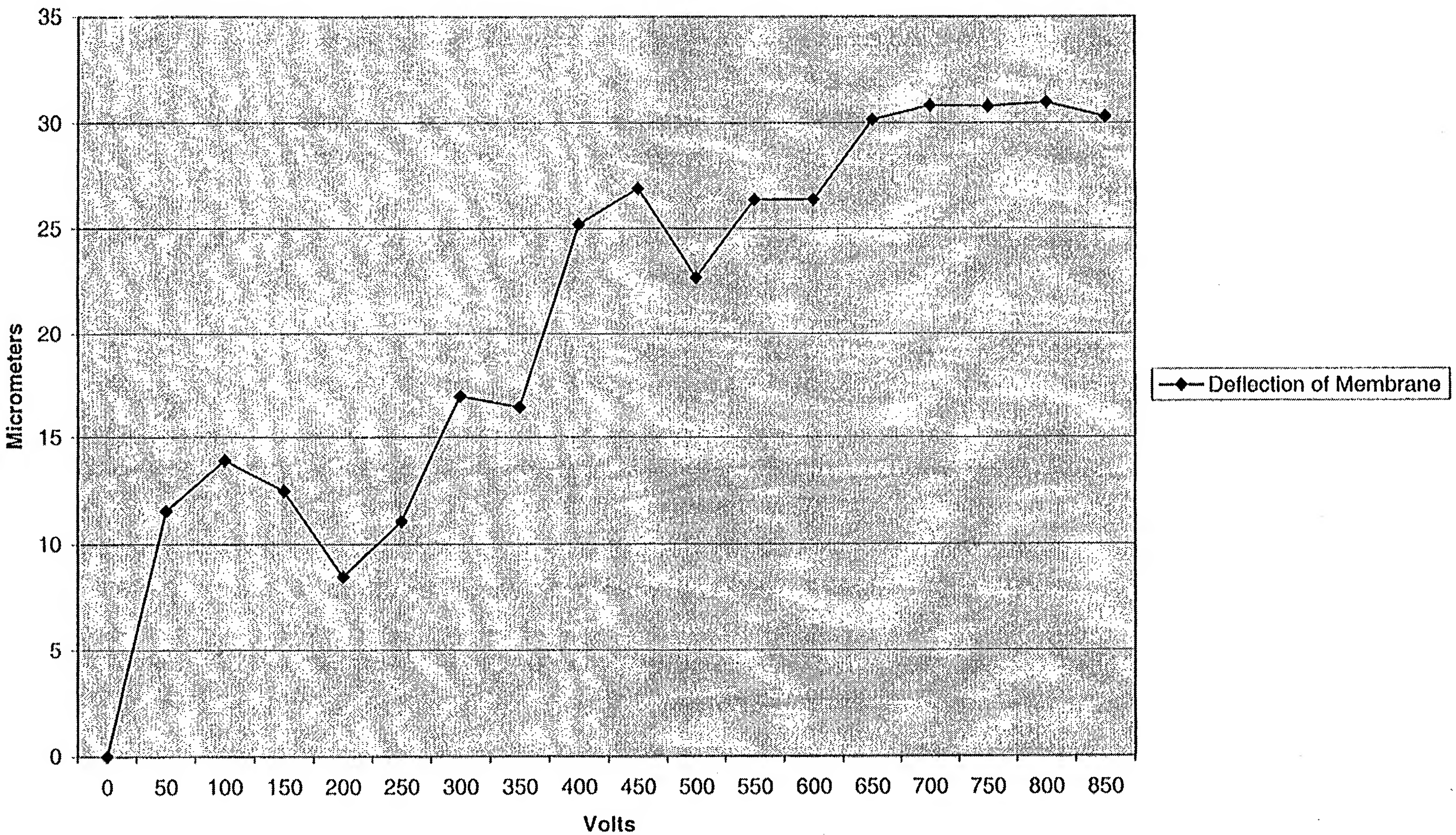
Deflection of Membrane due to Piezoelectric Effect (0.1 psi) - Positive Lead Attached to Positive Sign Side



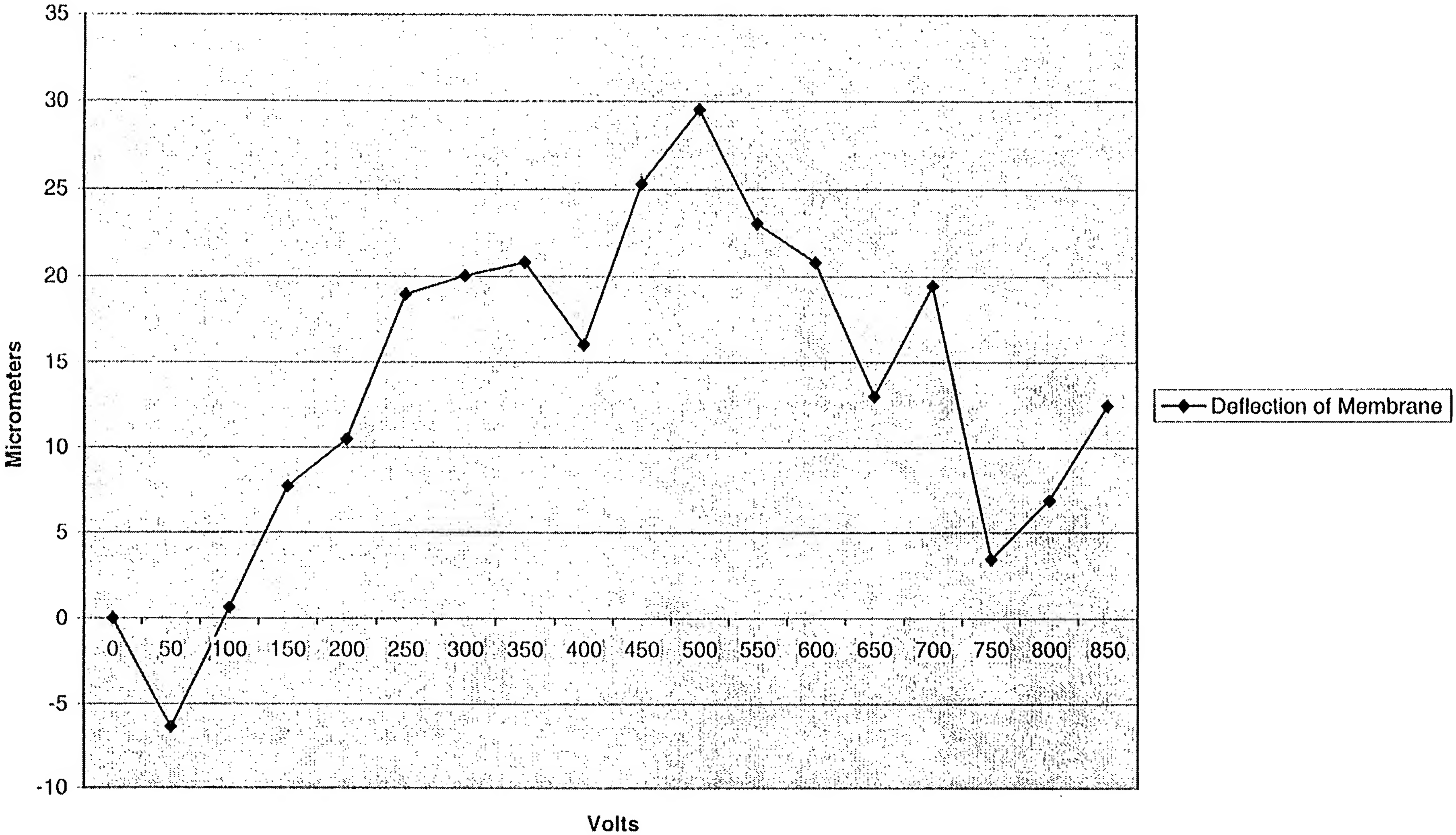
Deflection of Membrane due to Piezoelectric Effect (0.3 psi) - Positive Lead Attached to Positive Sign Side



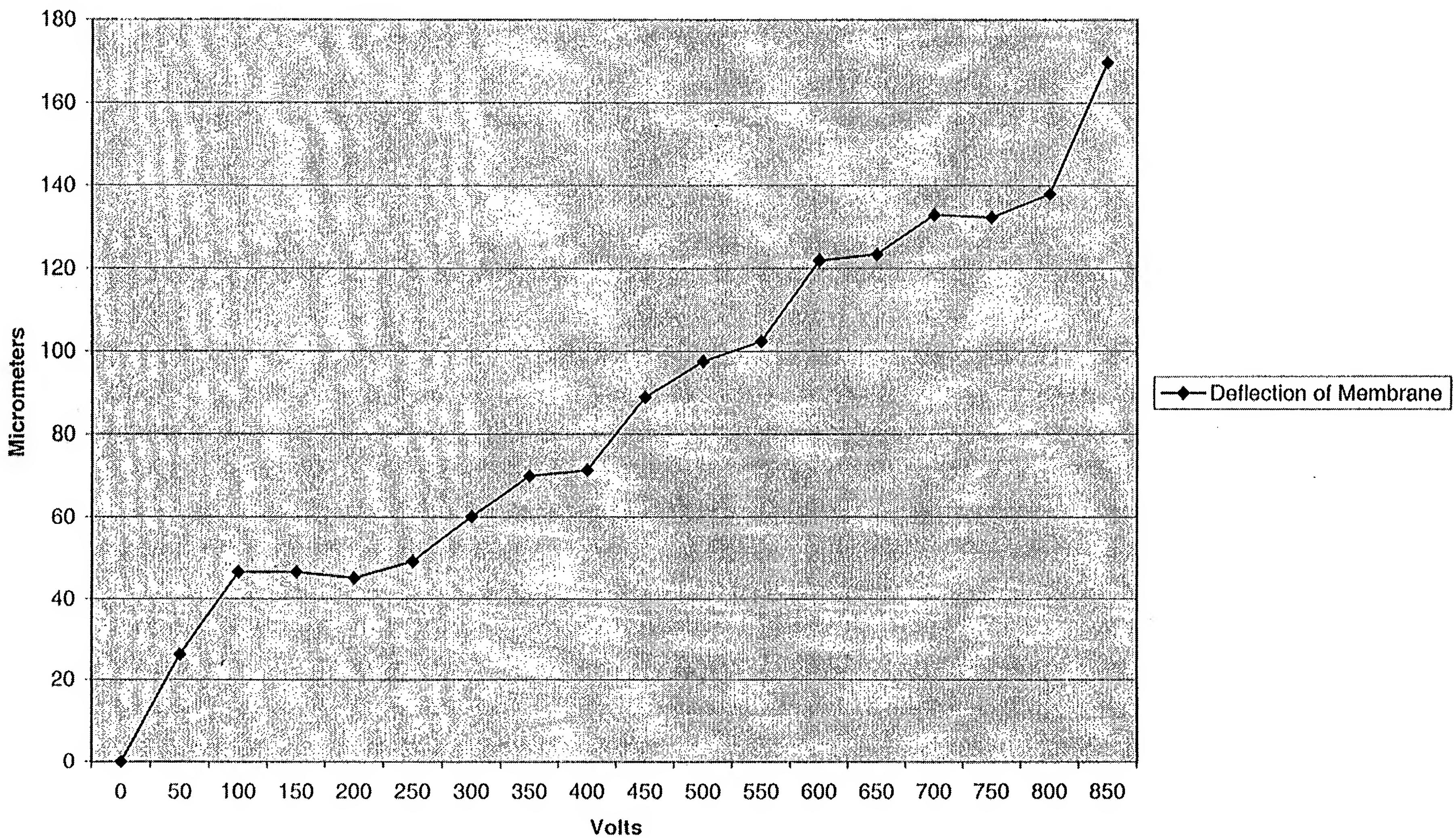
Deflection of Membrane due to Piezoelectric Effect (0.5 psi) - Positive Lead Attached to Positve Sign Side

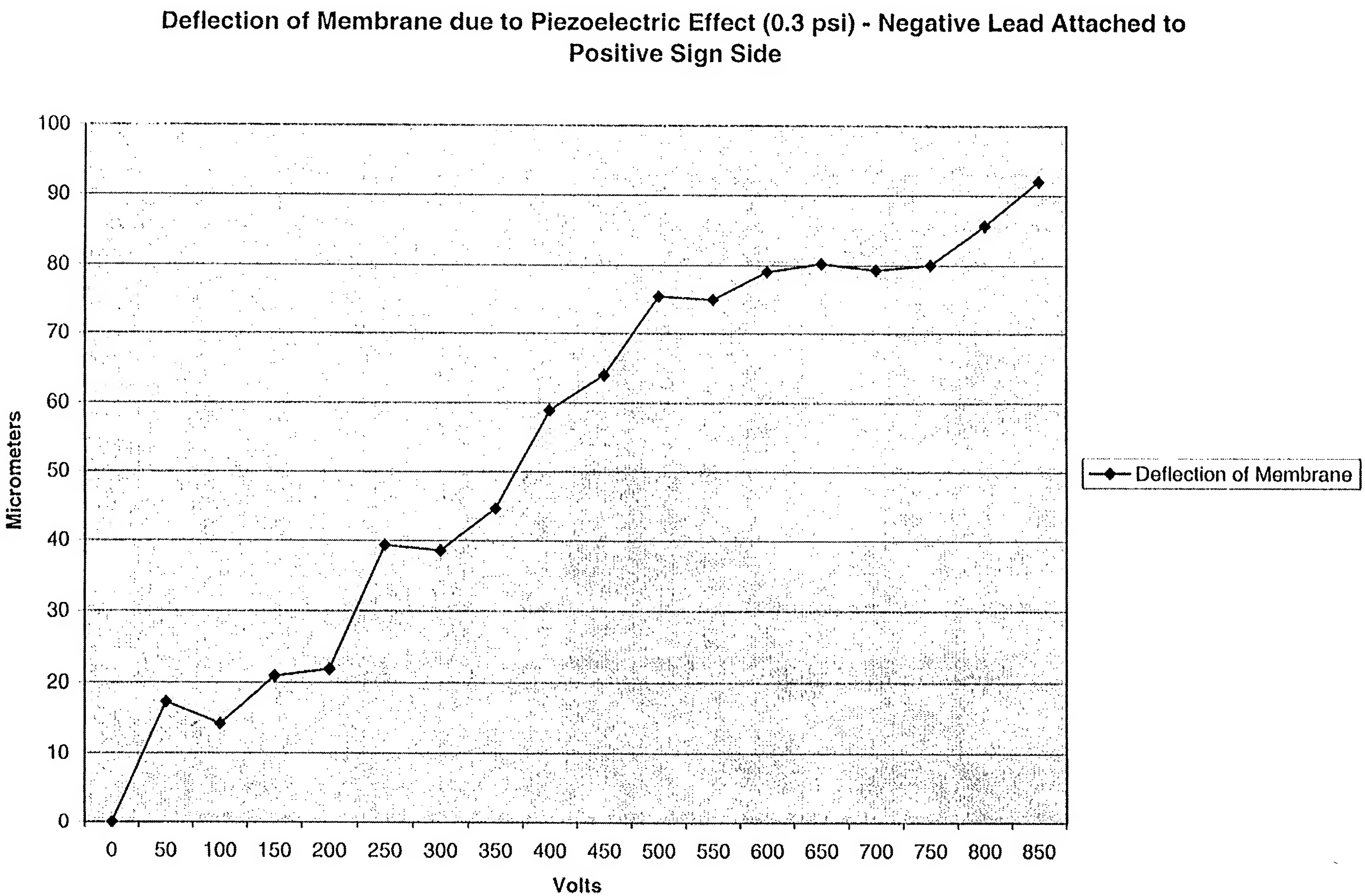


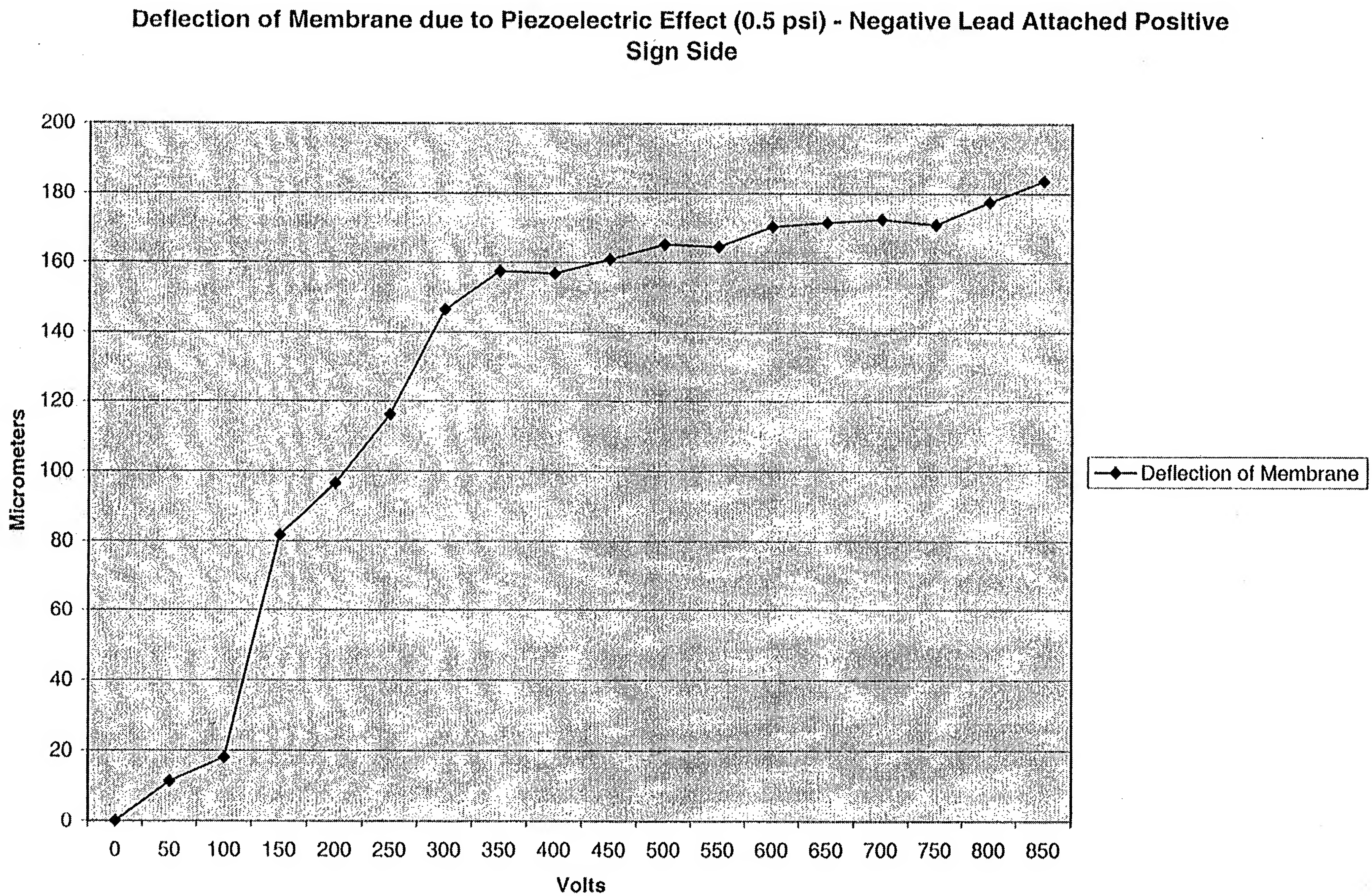
Deflection of Membrane due to Piezoelectric Effect (0.7 psi) - Positive Lead Attached Positive Sign Side



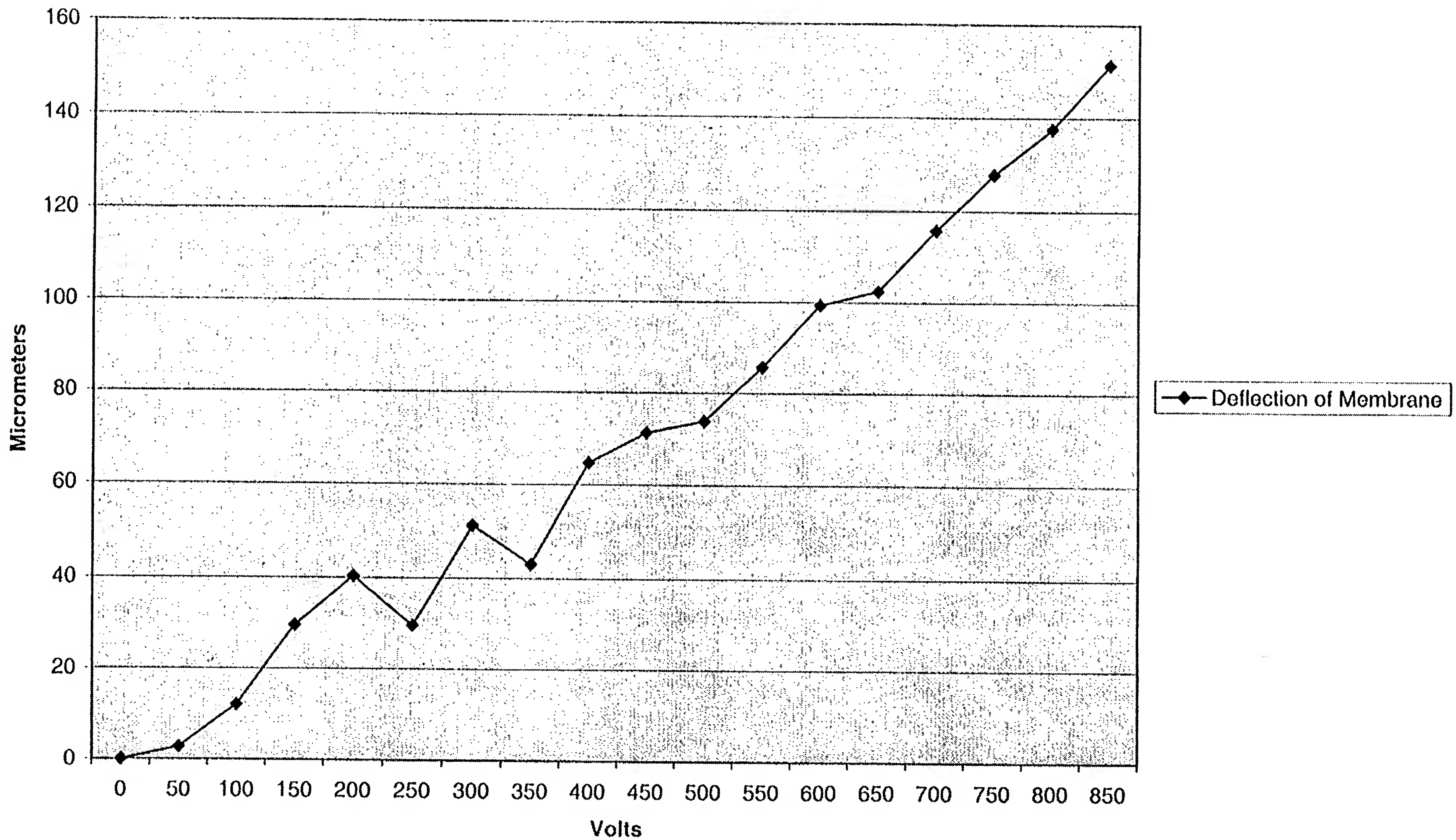
Deflection of Membrane due to Piezoelectric Effect (0.1 psi) - Negative Lead Attached to Positive Sign Side




Deflection of Membrane due to Piezoelectric Effect (0.3 psi) - Negative Lead Attached to Positive Sign Side
Micrometers
100
90
80
70
60
50
40
30
20
10
0
0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850
Volts
Deflection of Membrane


Deflection of Membrane due to Piezoelectric Effect (0.5 psi) - Negative Lead Attached Positive Sign Side
Micrometers
200
180
160
140
120
100
80
60
40
20
0
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Volts
Deflection of Membrane

Deflection of Membrane due to Piezoelectirc Effect (0.7 psi) - Negative Lead Attached Positive Sign Side



APPENDIX D. ANALYTICAL MODEL INFORMATION

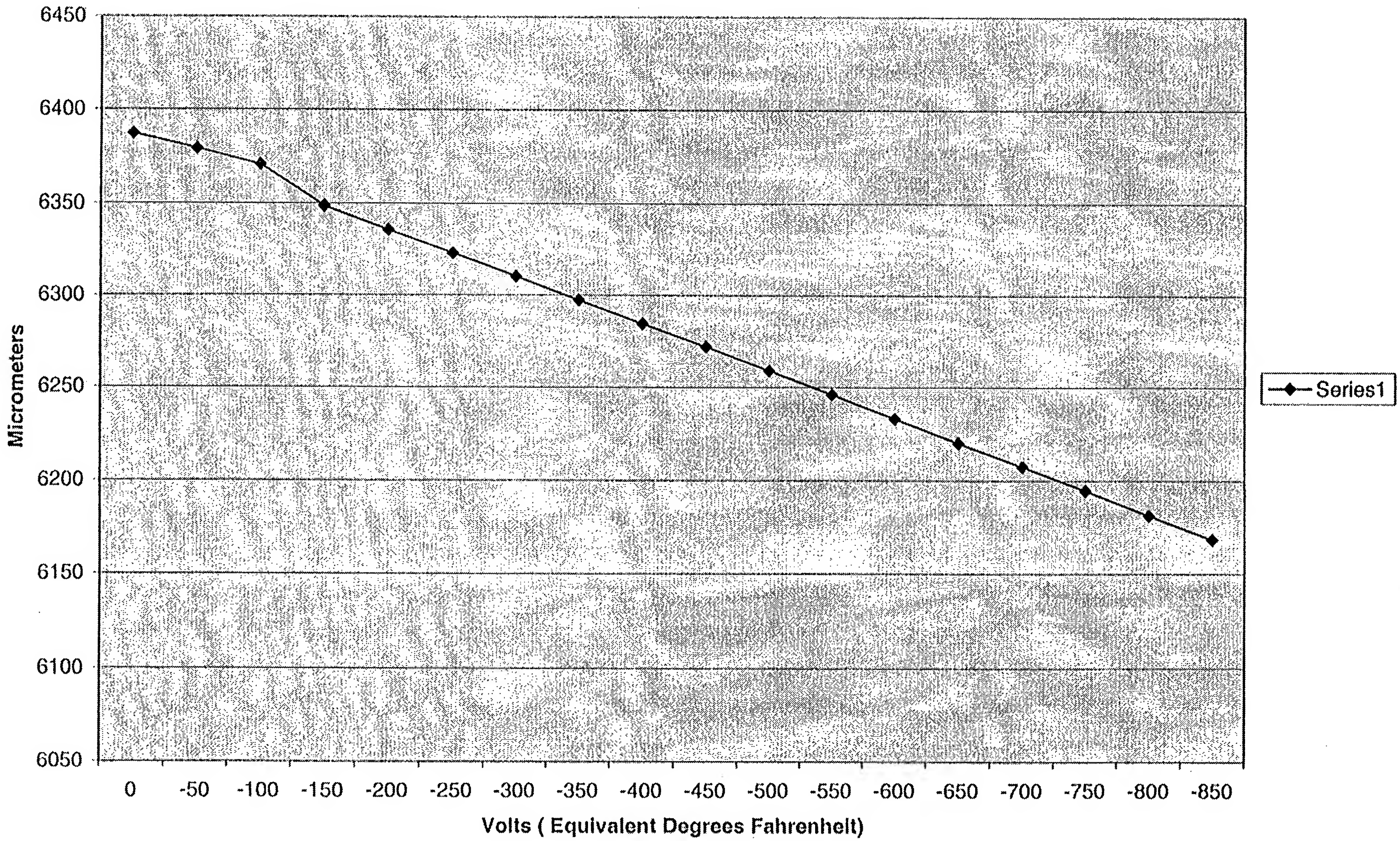
This appendix contains four main parts. They all pertain to the analytical model produced using NASTRAN and PATRAN. The four parts are:

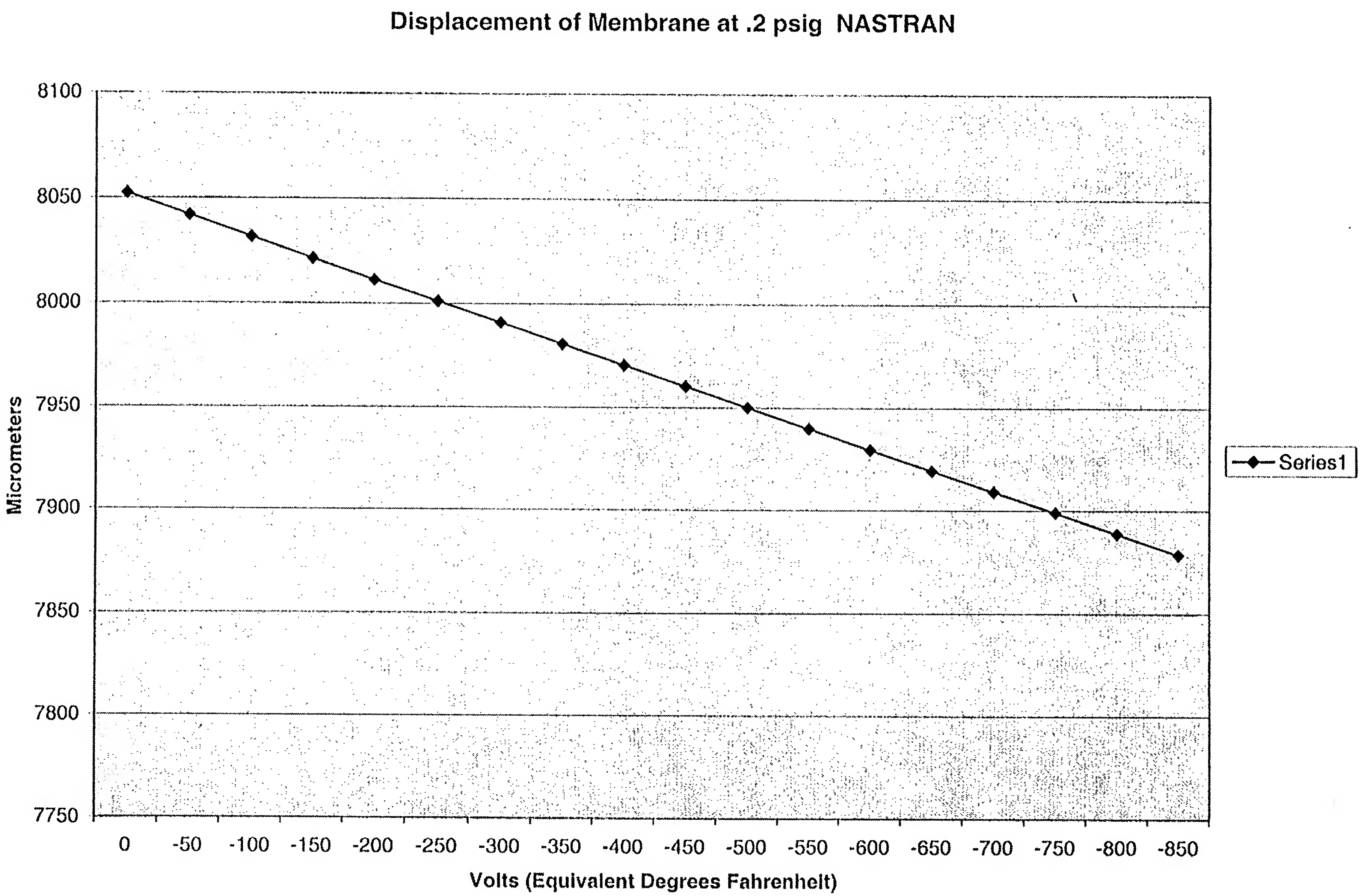
1. inputs necessary for the thermal analogy to model the piezoelectric effect
2. graphical displays of computer model results
3. the NASTRAN input file used to model the membrane
4. compilation of the displacement vectors of the first nine elements (starting at the center of the membrane and proceeding radially outward for six elements, then starting over at the center at element eight) for all combinations of pressures and temperatures

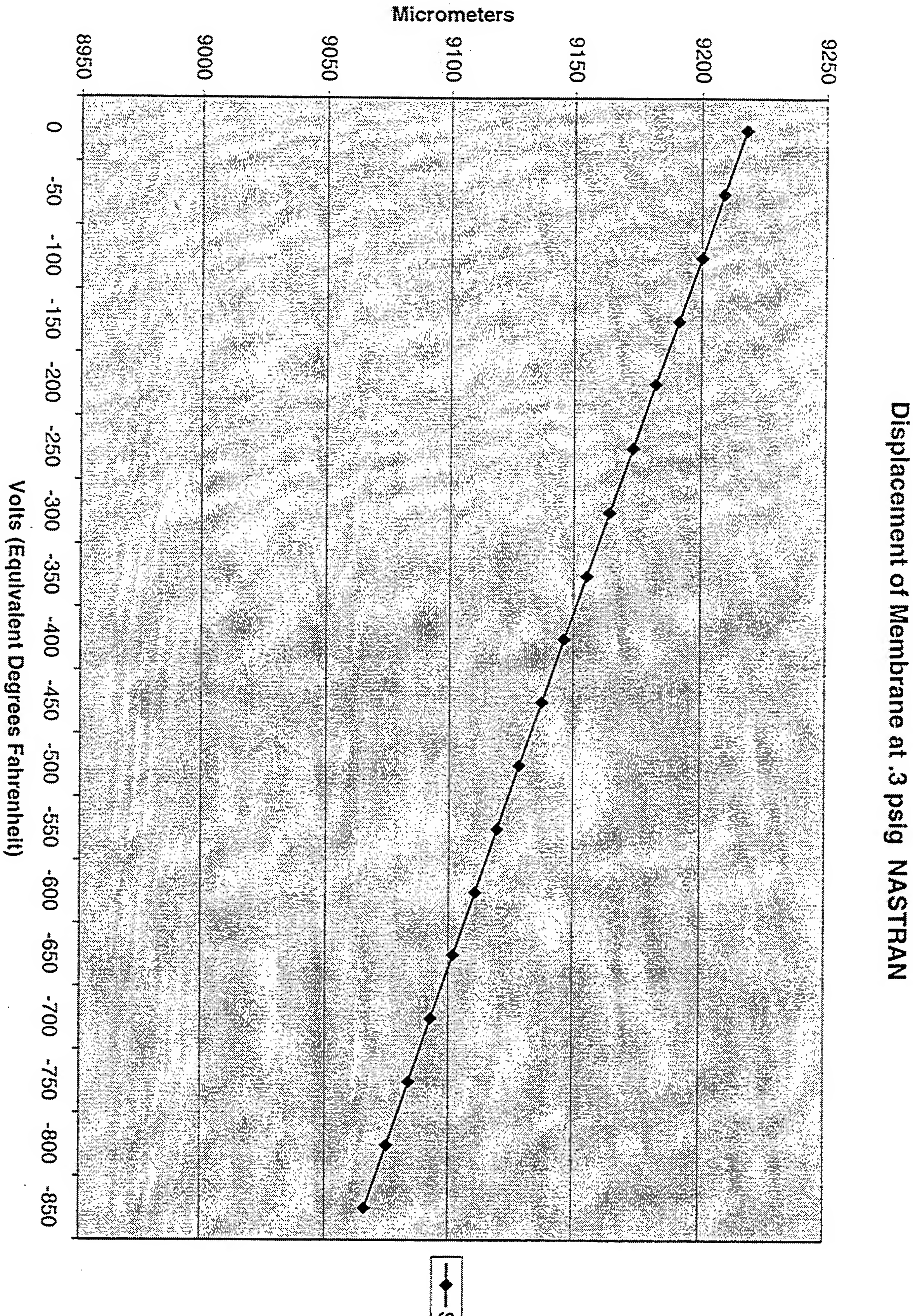
This data is completely computer generated.

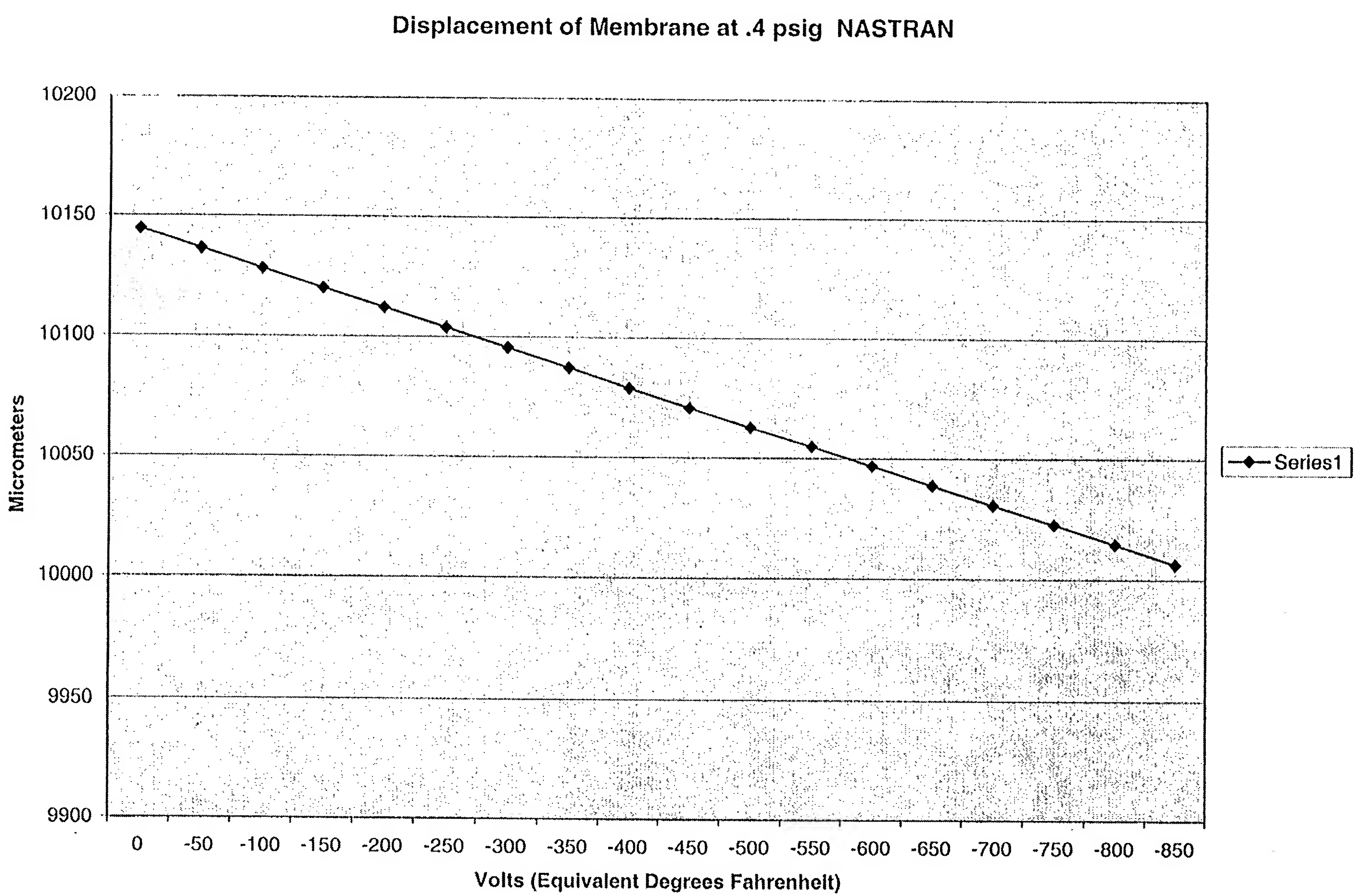
Voltage	d 31(in/in)/(V/in)	E 3 (V/in)	alpha 31 ((in/in)/(deg F)	T (deg F)	d 32(in/in)/(V/in)	E 3 (V/in)	alpha 32 ((in/in)/(deg F)	T (deg F)
0.00E+00	9.06E-10	0	4.42E-07	0.00E+00	1.182E-10	0	5.76923E-08	0.00E+00
5.00E+01	9.06E-10	24404.53	4.42E-07	5.00E+01	1.182E-10	24404.53	5.76923E-08	5.00E+01
1.00E+02	9.06E-10	48809.06	4.42E-07	1.00E+02	1.182E-10	48809.06	5.76923E-08	1.00E+02
1.50E+02	9.06E-10	73213.59	4.42E-07	1.50E+02	1.182E-10	73213.59	5.76923E-08	1.50E+02
2.00E+02	9.06E-10	97618.12	4.42E-07	2.00E+02	1.182E-10	97618.12	5.76923E-08	2.00E+02
2.50E+02	9.06E-10	122022.6	4.42E-07	2.50E+02	1.182E-10	122022.6	5.76923E-08	2.50E+02
3.00E+02	9.06E-10	146427.2	4.42E-07	3.00E+02	1.182E-10	146427.2	5.76923E-08	3.00E+02
3.50E+02	9.06E-10	170831.7	4.42E-07	3.50E+02	1.182E-10	170831.7	5.76923E-08	3.50E+02
4.00E+02	9.06E-10	195236.2	4.42E-07	4.00E+02	1.182E-10	195236.2	5.76923E-08	4.00E+02
4.50E+02	9.06E-10	219640.8	4.42E-07	4.50E+02	1.182E-10	219640.8	5.76923E-08	4.50E+02
5.00E+02	9.06E-10	244045.3	4.42E-07	5.00E+02	1.182E-10	244045.3	5.76923E-08	5.00E+02
5.50E+02	9.06E-10	268449.8	4.42E-07	5.50E+02	1.182E-10	268449.8	5.76923E-08	5.50E+02
6.00E+02	9.06E-10	292854.4	4.42E-07	6.00E+02	1.182E-10	292854.4	5.76923E-08	6.00E+02
6.50E+02	9.06E-10	317258.9	4.42E-07	6.50E+02	1.182E-10	317258.9	5.76923E-08	6.50E+02
7.00E+02	9.06E-10	341663.4	4.42E-07	7.00E+02	1.182E-10	341663.4	5.76923E-08	7.00E+02
7.50E+02	9.06E-10	366067.9	4.42E-07	7.50E+02	1.182E-10	366067.9	5.76923E-08	7.50E+02
8.00E+02	9.06E-10	390472.5	4.42E-07	8.00E+02	1.182E-10	390472.5	5.76923E-08	8.00E+02
8.50E+02	9.06E-10	414877	4.42E-07	8.50E+02	1.182E-10	414877	5.76923E-08	8.50E+02

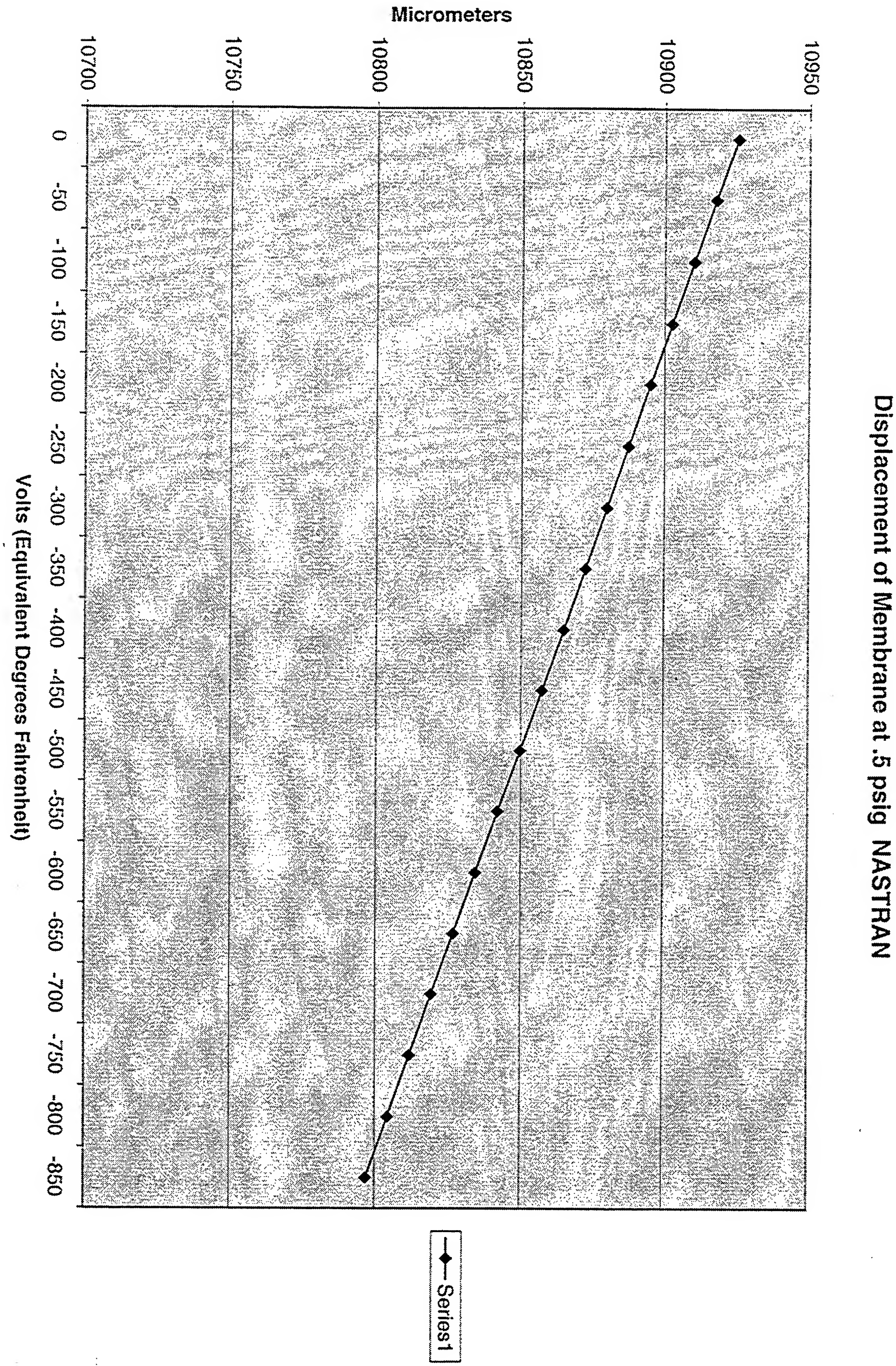
Displacement of Membrane at .1 psig   NASTRAN

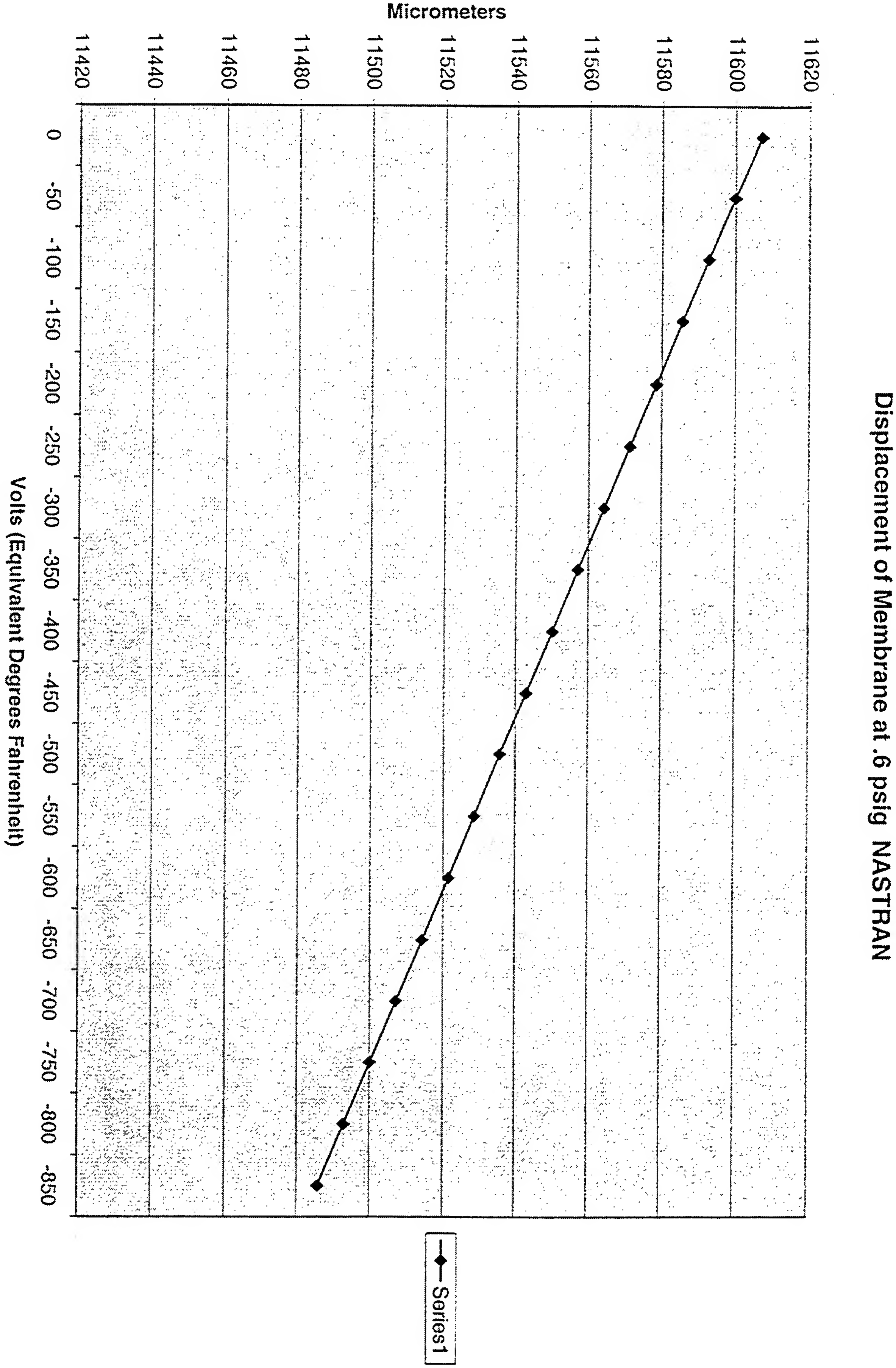



Displacement of Membrane at .2 psig NASTRAN
Micrometers
8100
8050
8000
7950
7900
7850
7800
7750
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
-550
-600
-650
-700
-750
-800
-850
Volts (Equivalent Degrees Fahrenheit)
Series1

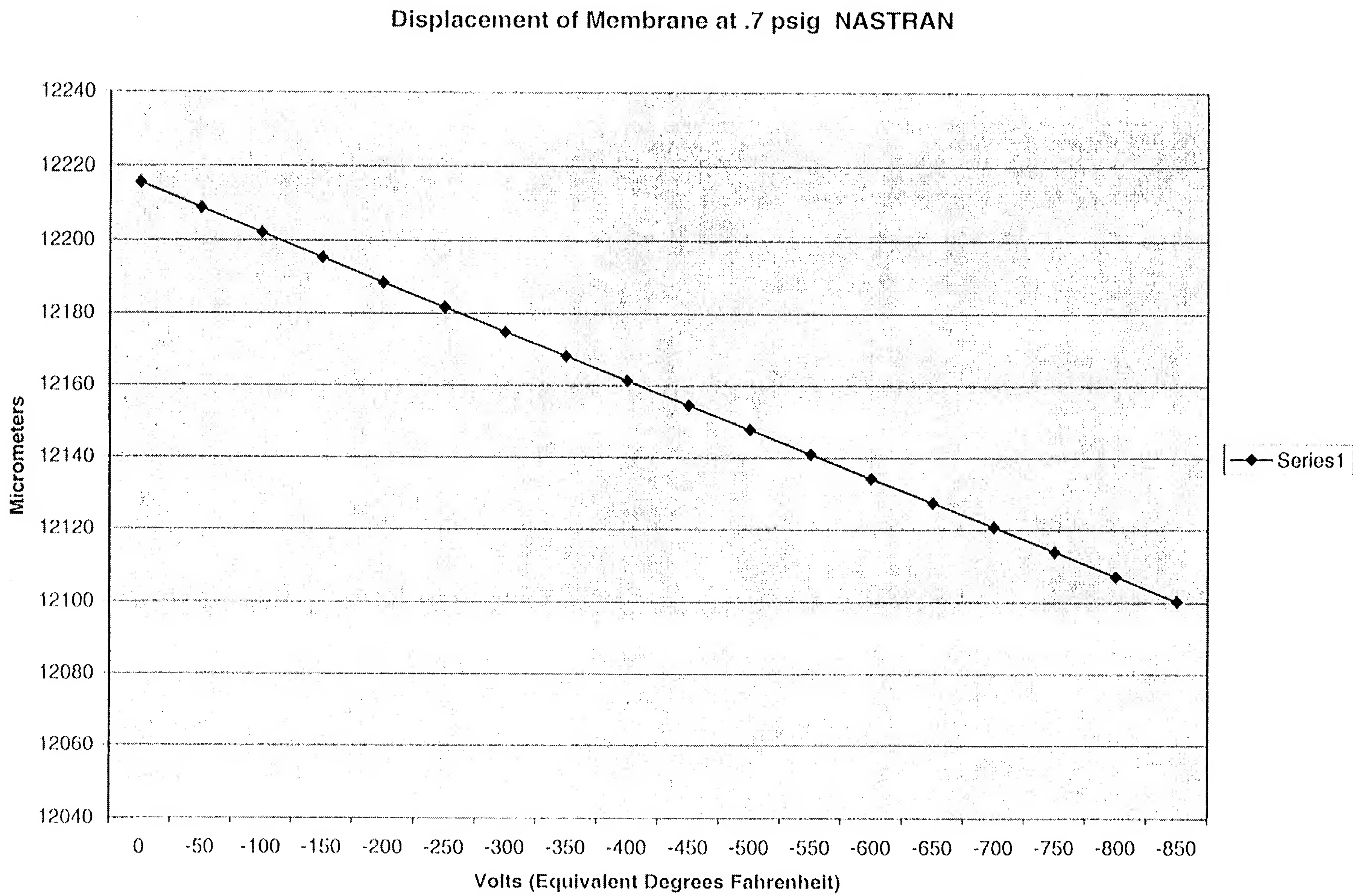

Displacement of Membrane at .3 psig NASTRAN
Micrometers
8950
9000
9050
9100
9150
9200
9250
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
-550
-600
-650
-700
-750
-800
-850
Volts (Equivalent Degrees Fahrenheit)
Series1


Displacement of Membrane at .4 psig NASTRAN
Micrometers
10200
10150
10100
10050
10000
9950
9900
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
-550
-600
-650
-700
-750
-800
-850
Volts (Equivalent Degrees Fahrenheit)
Series1

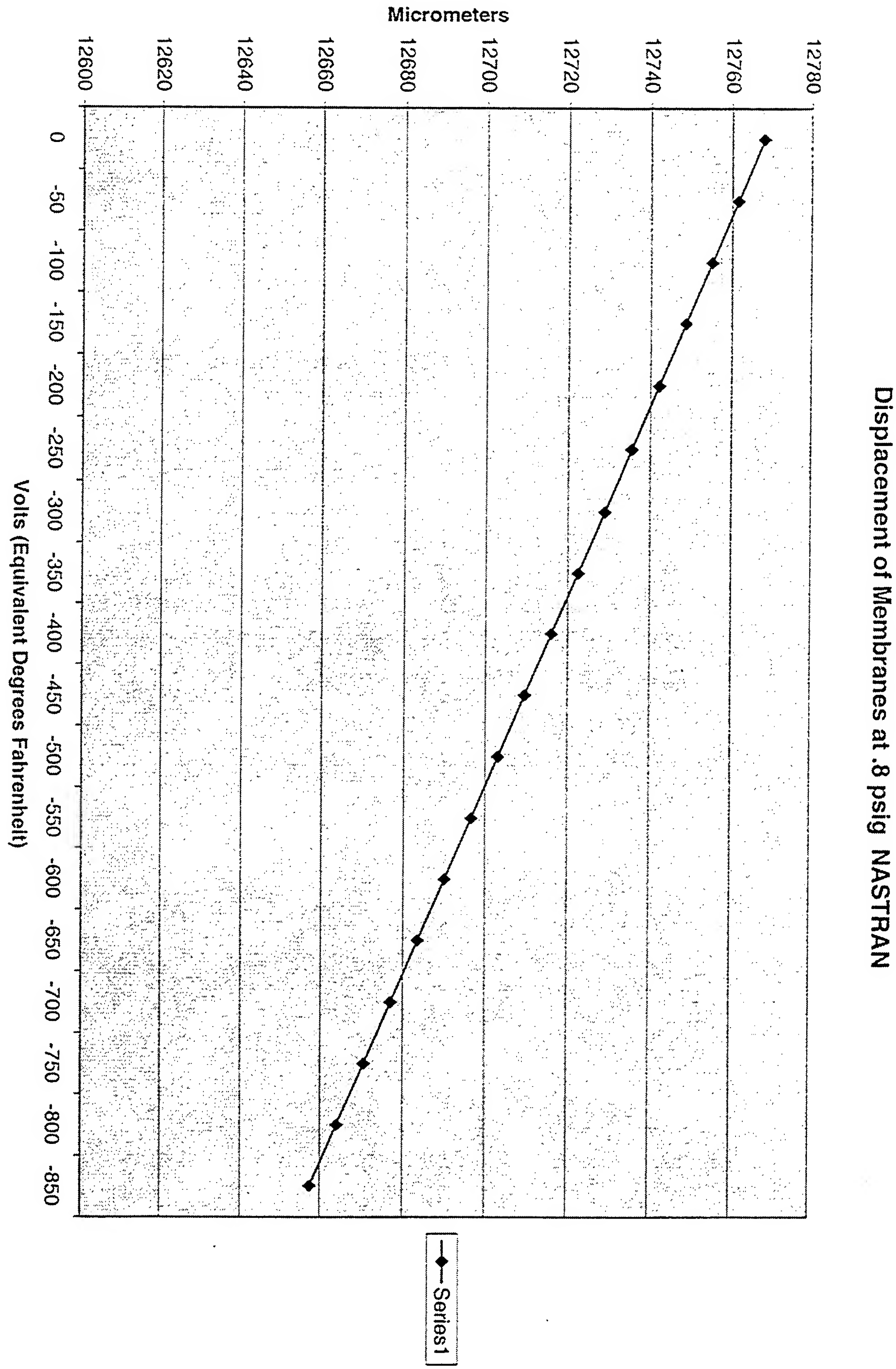

Displacement of Membrane at .5 psig NASTRAN
Micrometers
10700
10750
10800
10850
10900
10950
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
-550
-600
-650
-700
-750
-800
-850
Volts (Equivalent Degrees Fahrenheit)
Series1

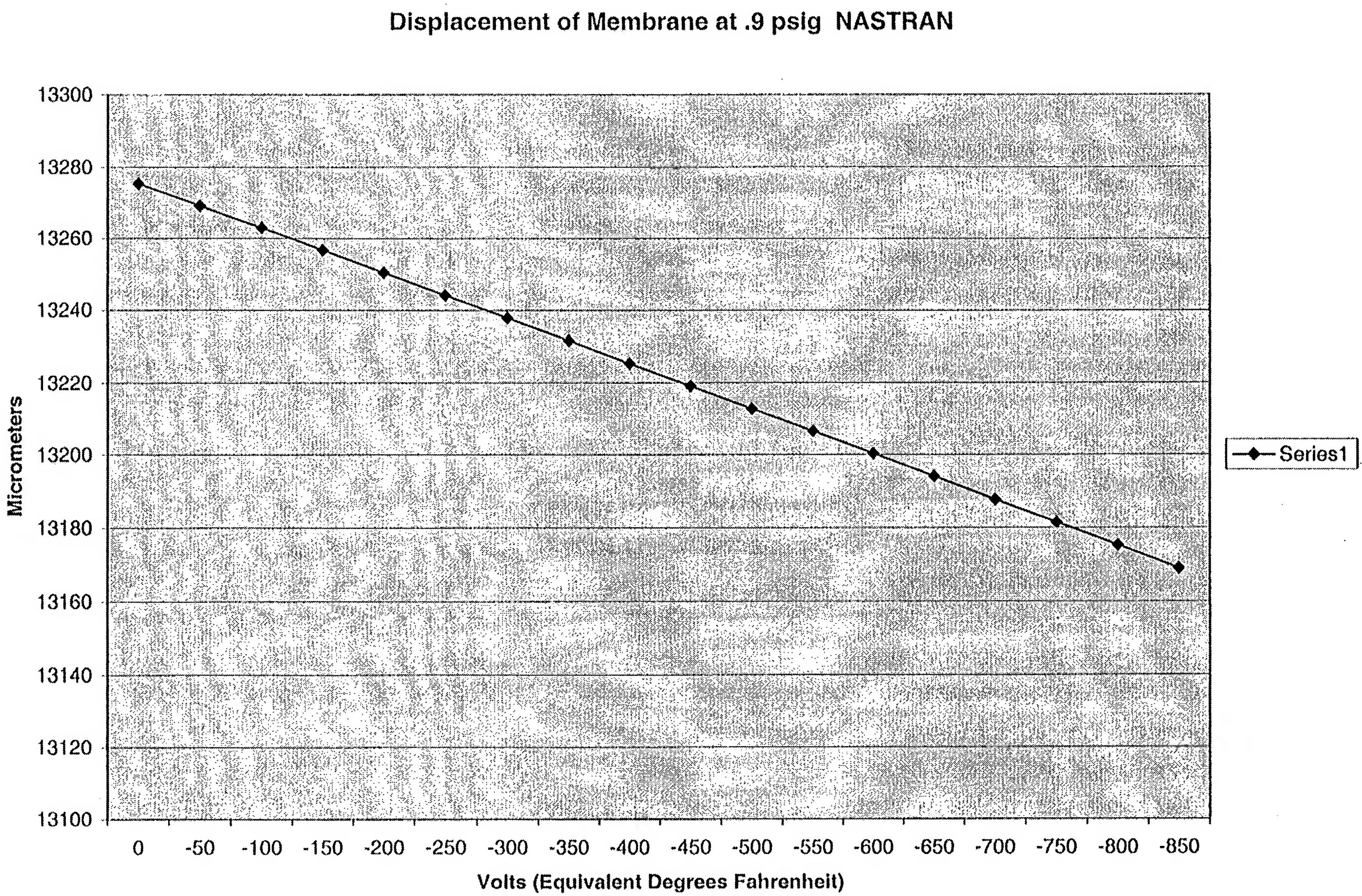


Displacement of Membrane at .6 psig NASTRAN
Micrometers
11620
11600
11580
11560
11540
11520
11500
11480
11460
11440
11420
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
-550
-600
-650
-700
-750
-800
-850
Volts (Equivalent Degrees Fahrenheit)
Series1

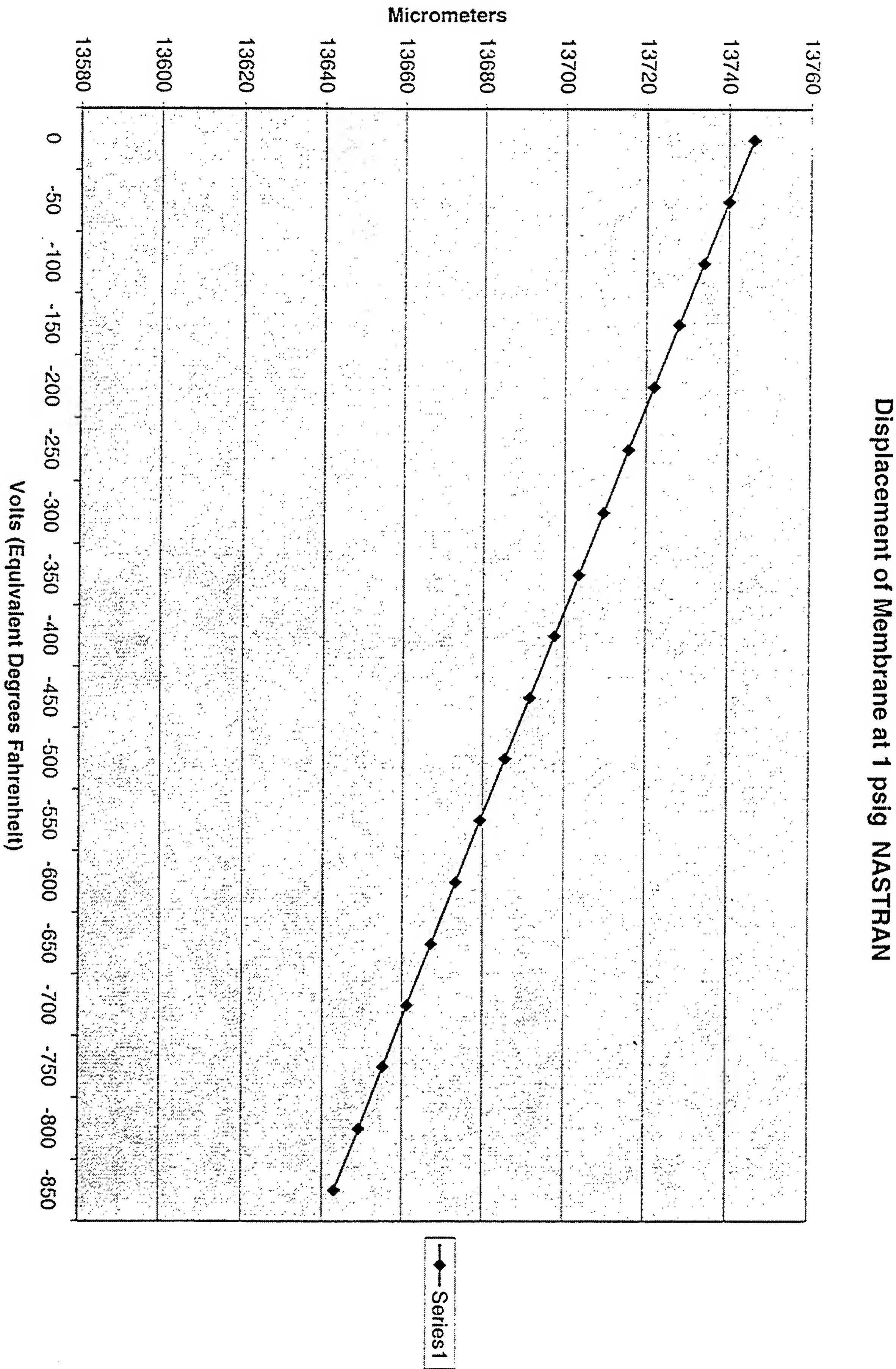


Displacement of Membrane at .7 psig NASTRAN
Micrometers
12240
12220
12200
12180
12160
12140
12120
12100
12080
12060
12040
0 -50 -100 -150 -200 -250 -300 -350 -400 -450 -500 -550 -600 -650 -700 -750 -800 -850
Volts (Equivalent Degrees Fahrenheit)
Series1

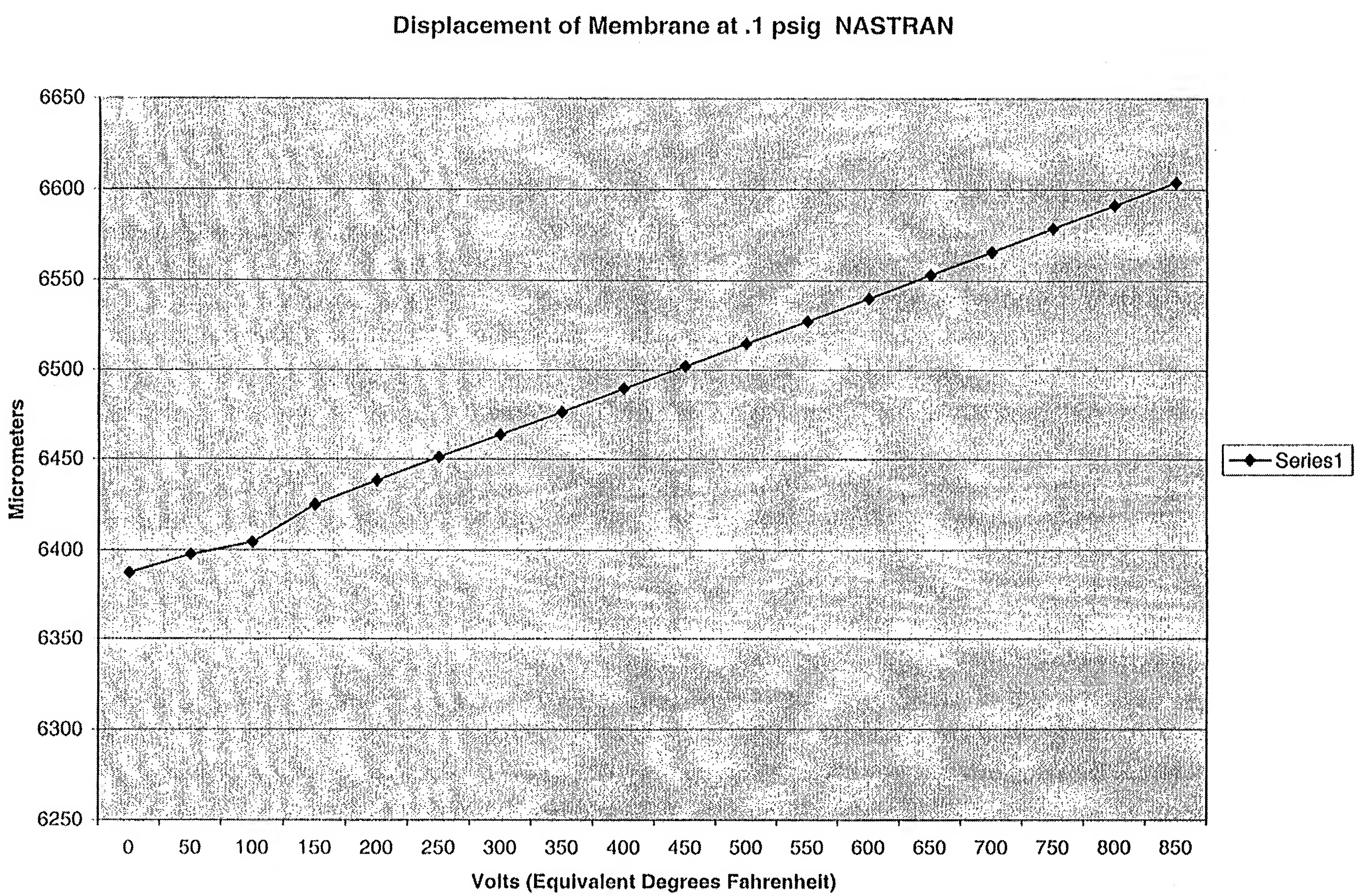

Displacement of Membranes at .8 psig NASTRAN
Micrometers
12600
12620
12640
12660
12680
12700
12720
12740
12760
12780
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
-550
-600
-650
-700
-750
-800
-850
Volts (Equivalent Degrees Fahrenhelt)
Series1



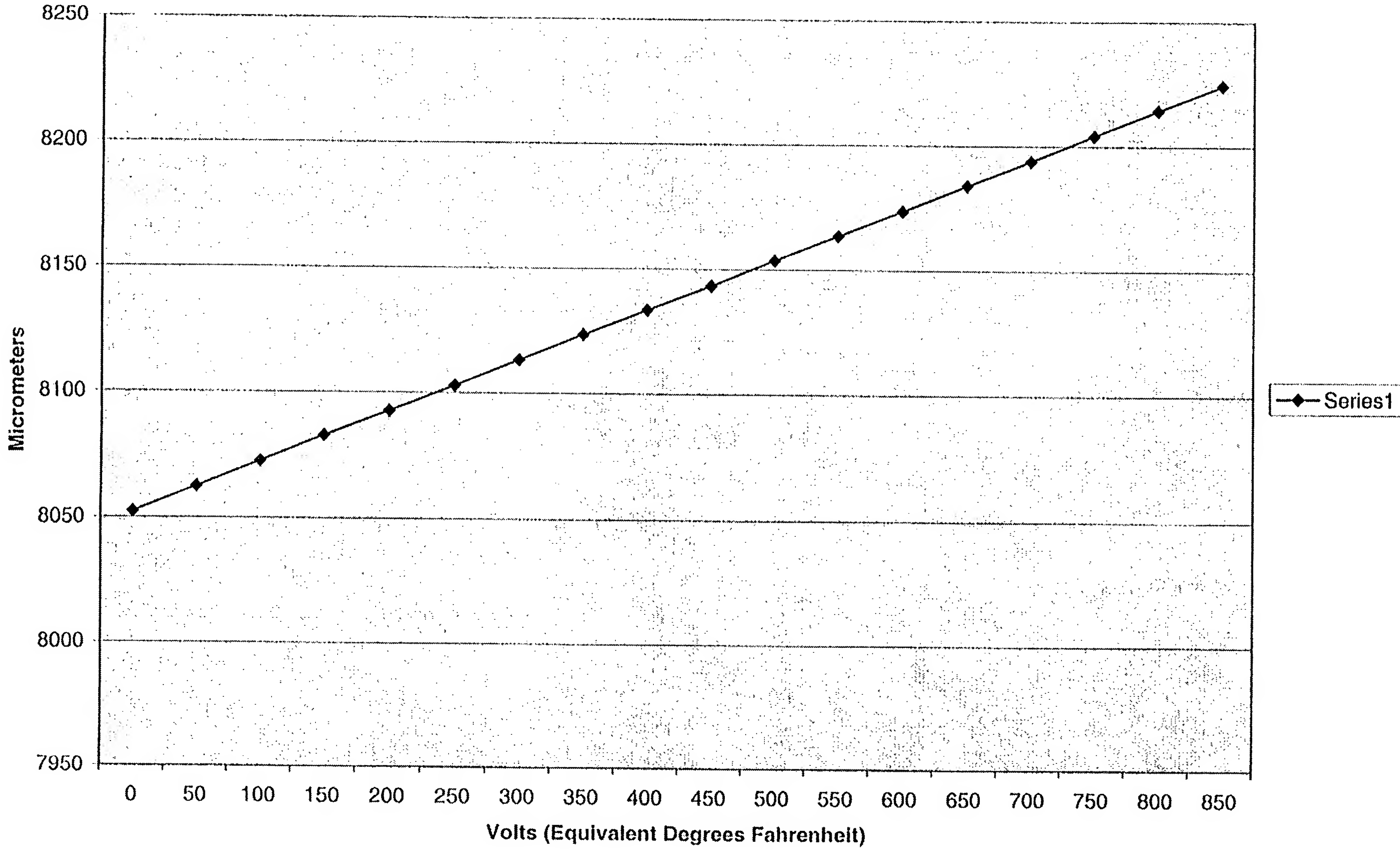
Displacement of Membrane at .9 psig NASTRAN
Micrometers
13300
13280
13260
13240
13220
13200
13180
13160
13140
13120
13100
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
-550
-600
-650
-700
-750
-800
-850
Volts (Equivalent Degrees Fahrenheit)
Series1

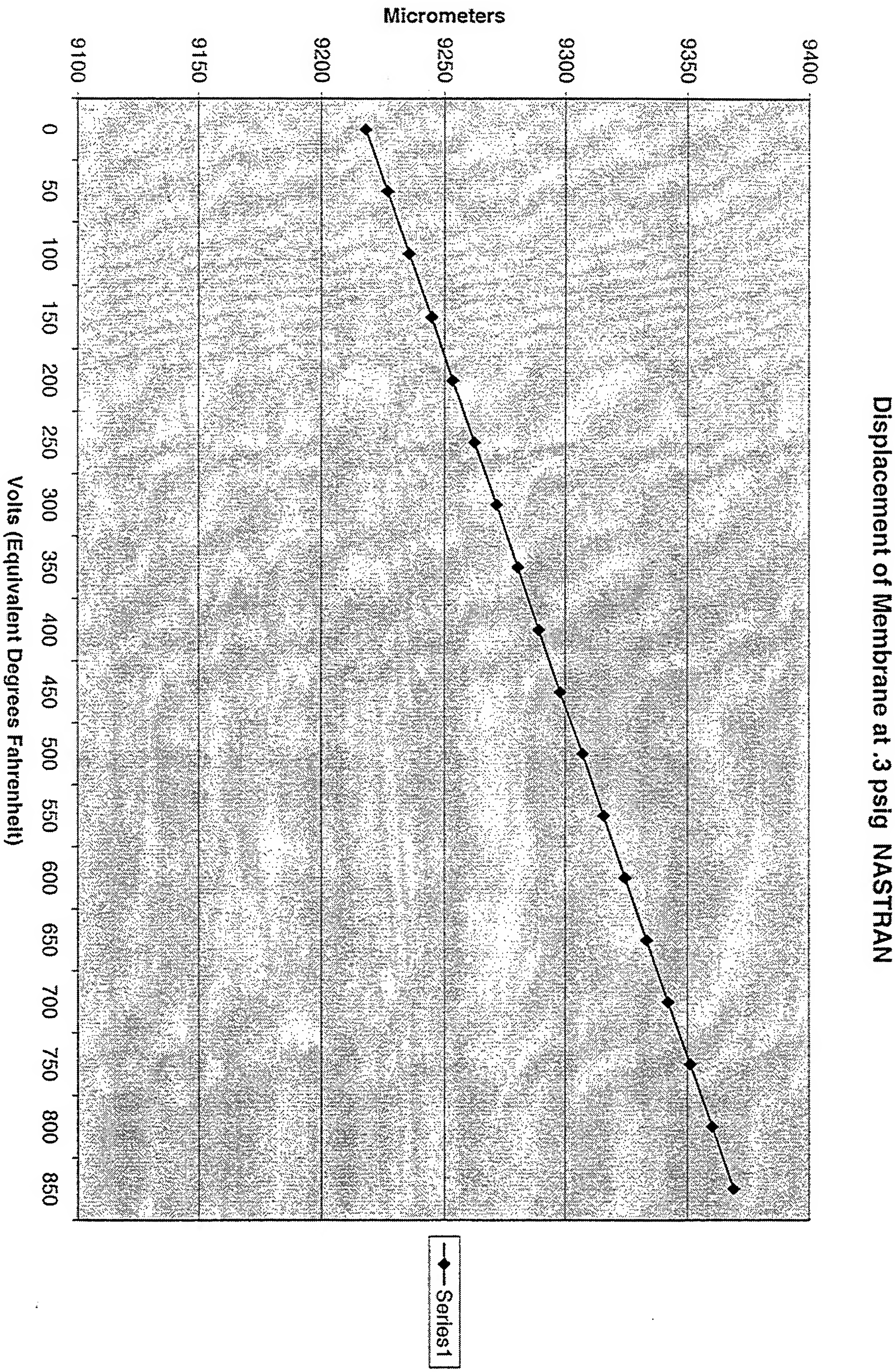


Displacement of Membrane at 1 psig NASTRAN
Micrometers
13580
13600
13620
13640
13660
13680
13700
13720
13740
13760
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
-550
-600
-650
-700
-750
-800
-850
Volts (Equivalent Degrees Fahrenheit)
Series1

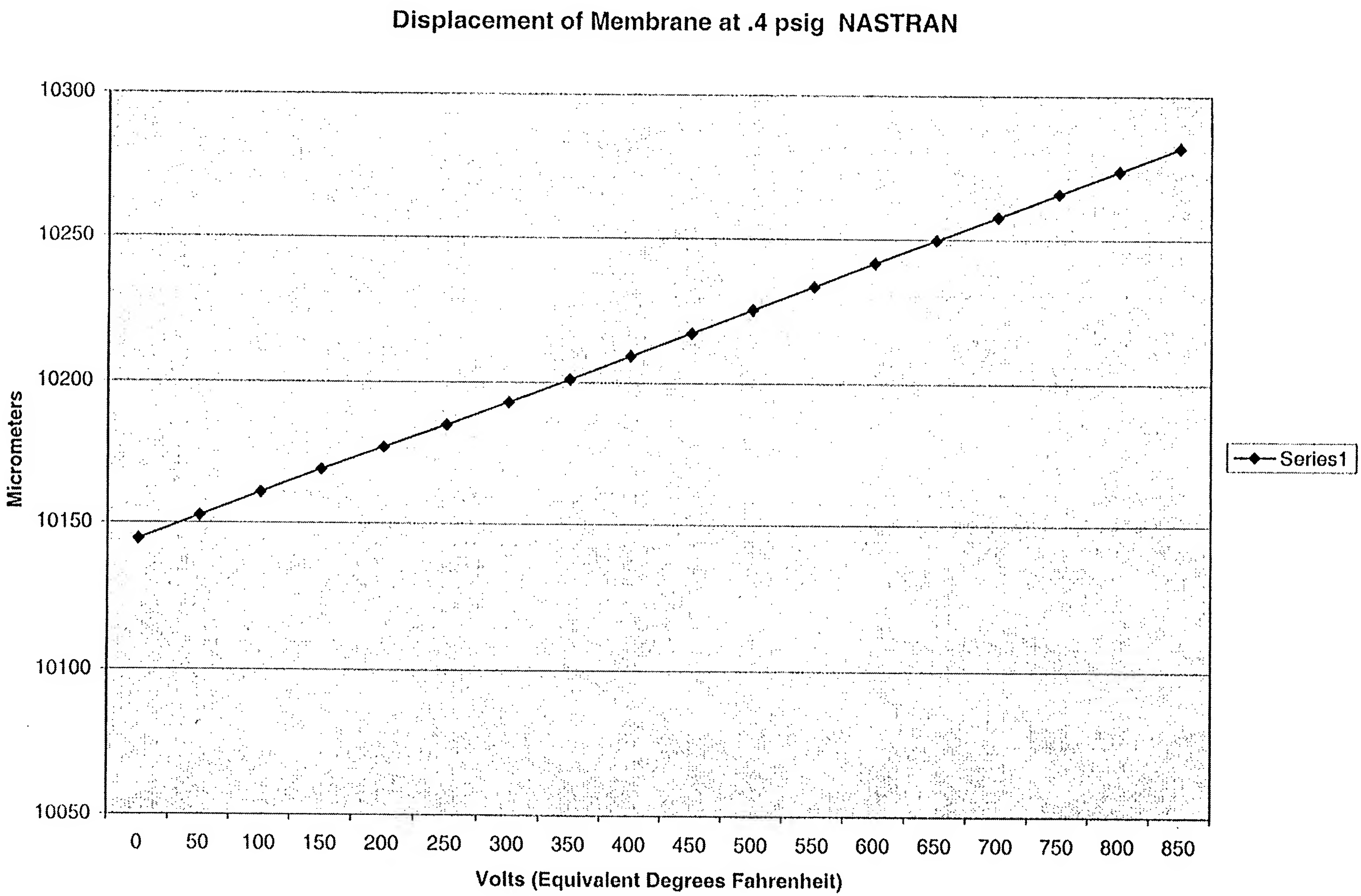

Displacement of Membrane at .1 psig NASTRAN
Micrometers
6650
6600
6550
6500
6450
6400
6350
6300
6250
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Volts (Equivalent Degrees Fahrenheit)
Series1

Displacement of Membrane at .2 psig NASTRAN

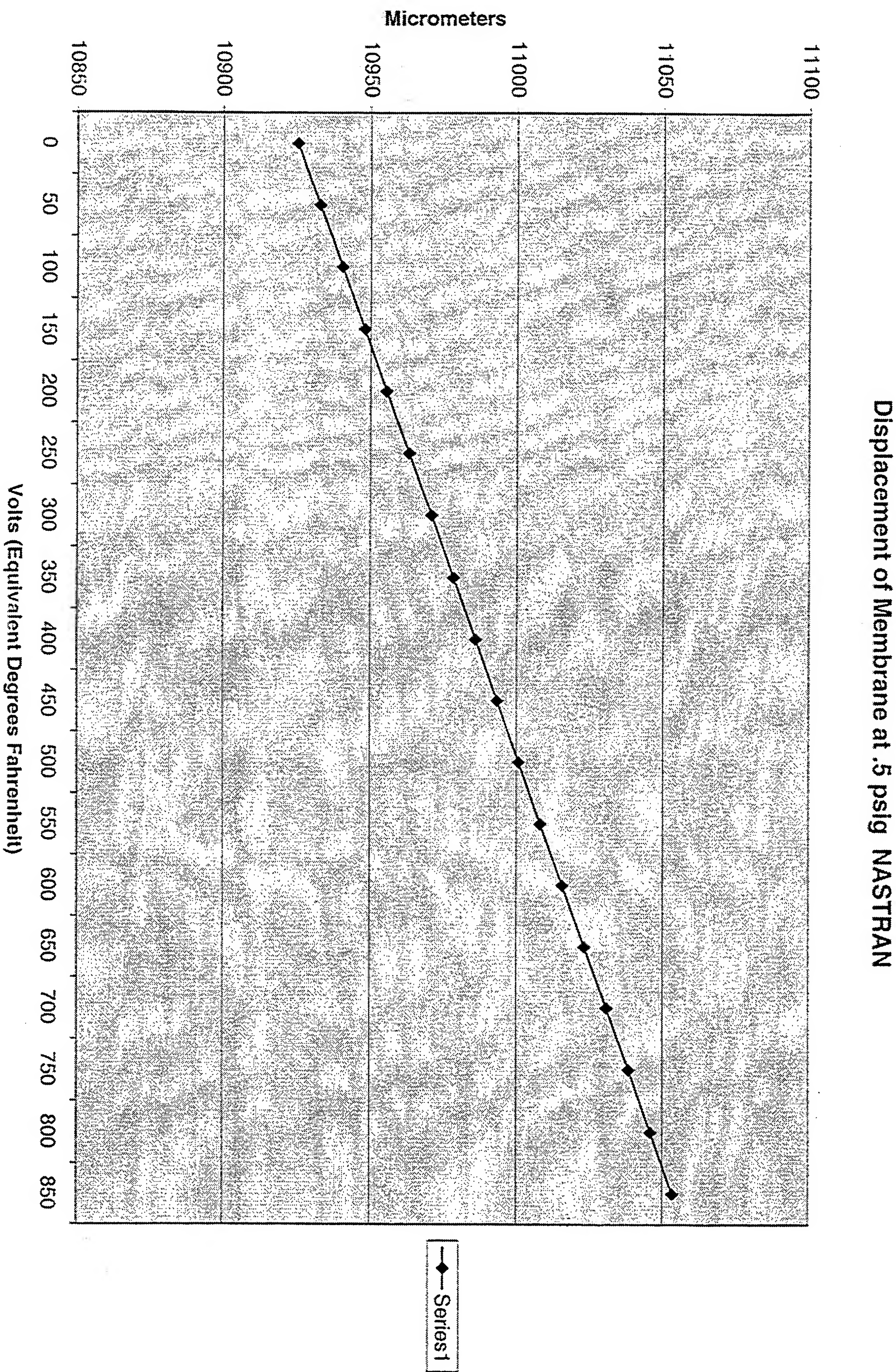


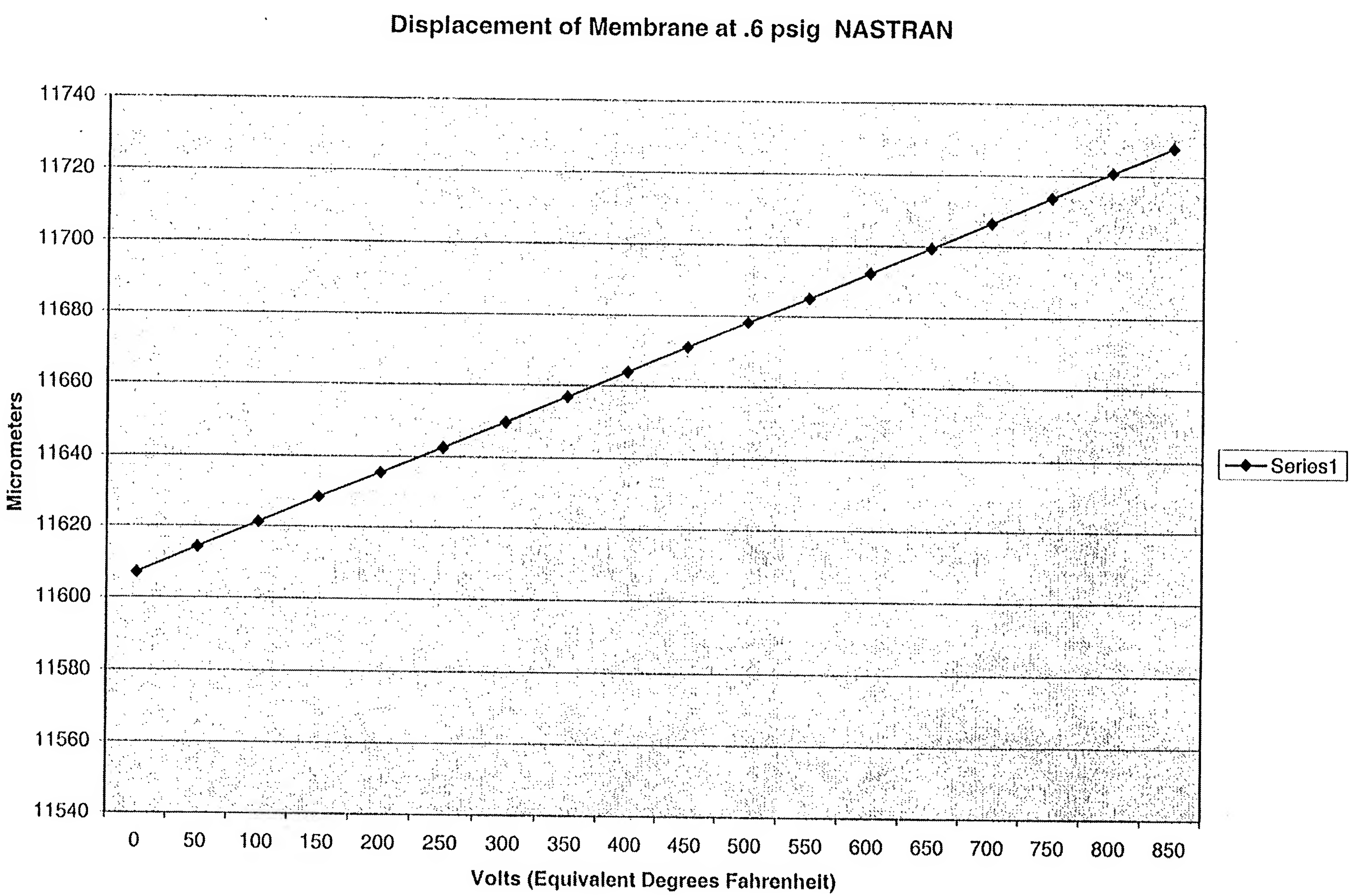


Displacement of Membrane at .3 psig NASTRAN
Micrometers
9100
9150
9200
9250
9300
9350
9400
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Volts (Equivalent Degrees Fahrenheit)
Series1



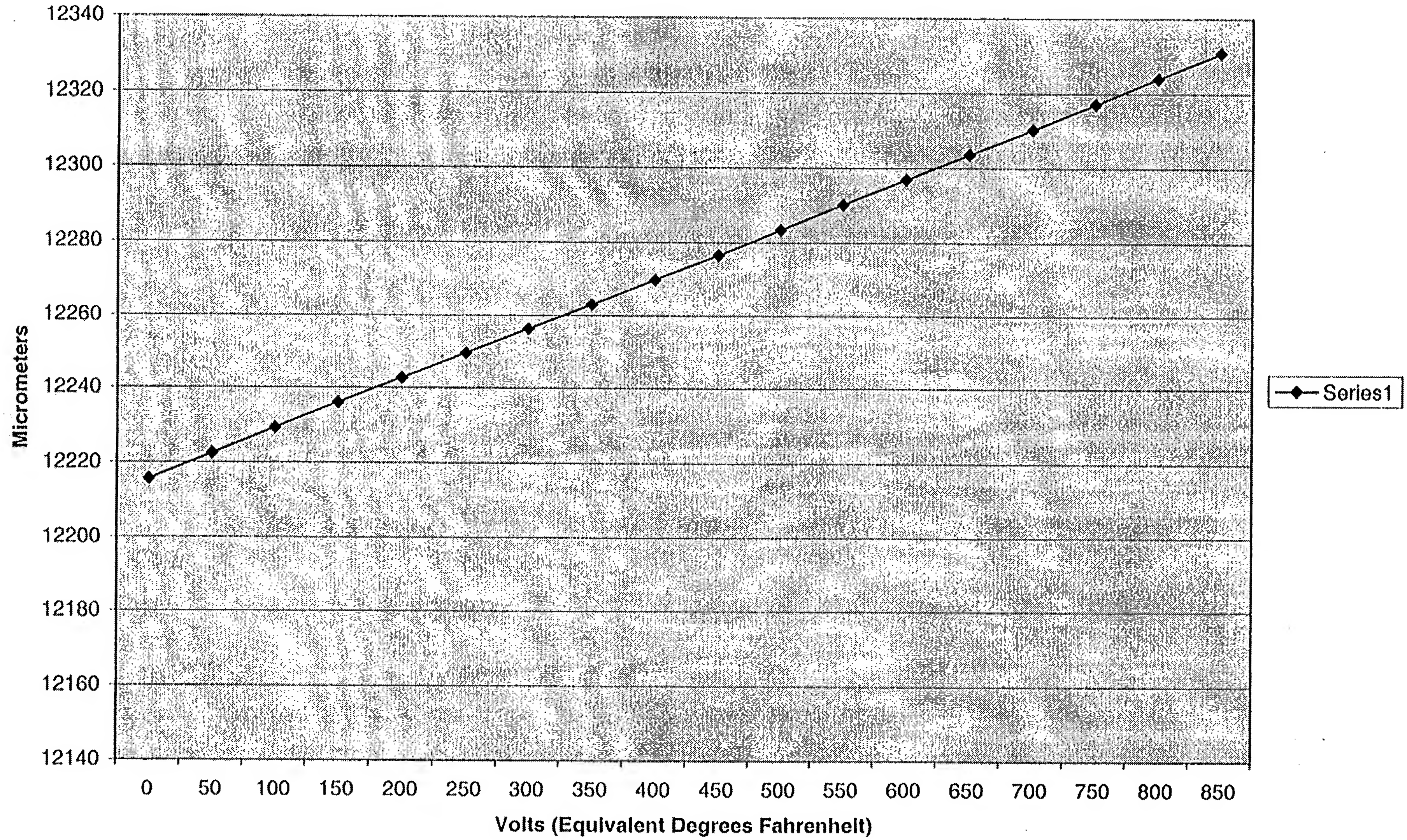
Displacement of Membrane at .4 psig NASTRAN
Micrometers
10300
10250
10200
10150
10100
10050
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Volts (Equivalent Degrees Fahrenheit)
Series1

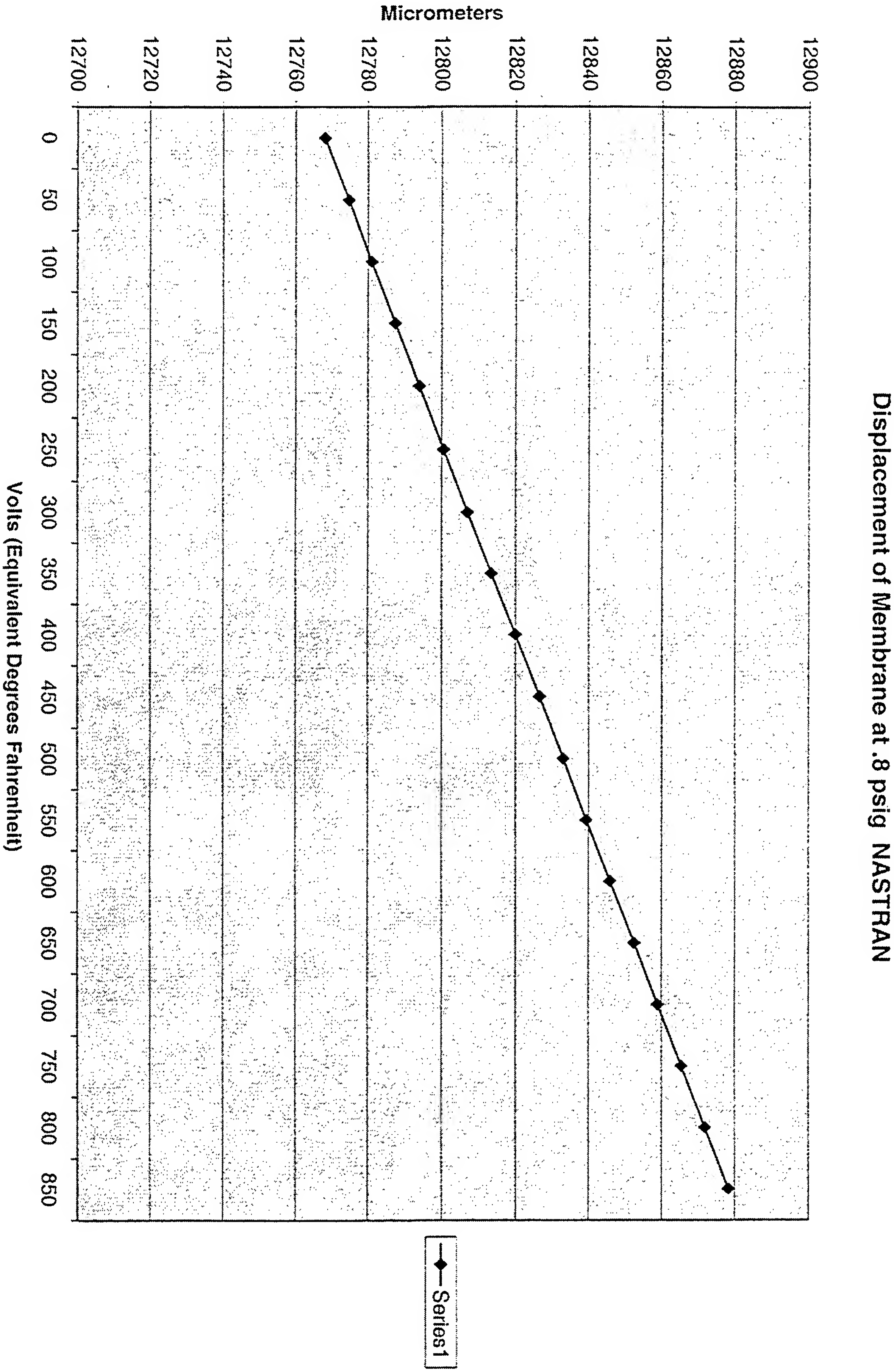

Displacement of Membrane at .5 psig NASTRAN
Micrometers
10850
10900
10950
11000
11050
11100
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Volts (Equivalent Degrees Fahrenheit)
Series1



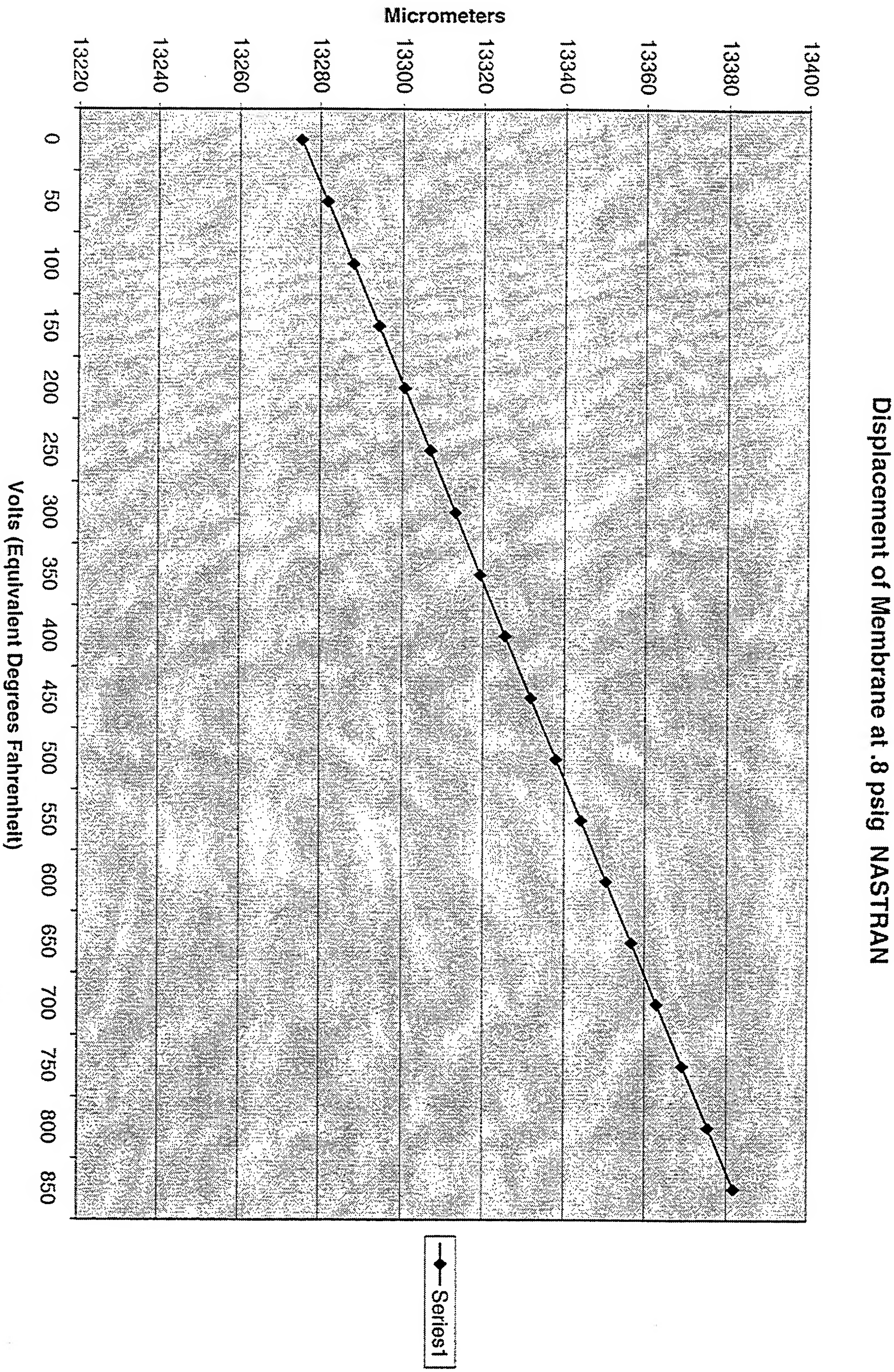
Displacement of Membrane at .6 psig NASTRAN
Micrometers
11740
11720
11700
11680
11660
11640
11620
11600
11580
11560
11540
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Volts (Equivalent Degrees Fahrenheit)
Series1

Displacement of Membrane at .7 psig NASTRAN

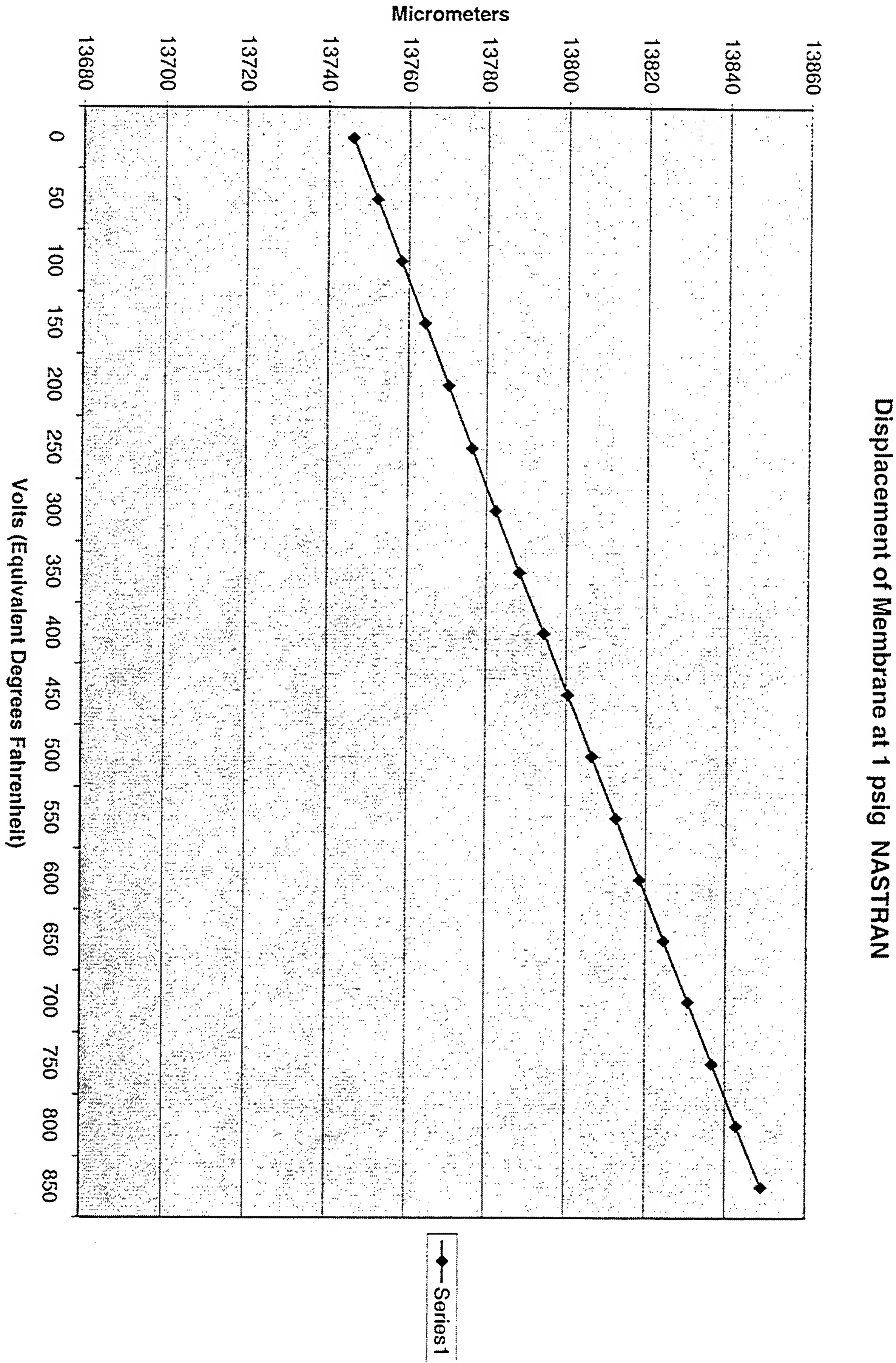




Displacement of Membrane at .8 psig NASTRAN
Micrometers
12700
12720
12740
12760
12780
12800
12820
12840
12860
12880
12900
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Volts (Equivalent Degrees Fahrenheit)
Series1



Displacement of Membrane at .8 psig NASTRAN
Micrometers
13220
13240
13260
13280
13300
13320
13340
13360
13380
13400
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Volts (Equivalent Degrees Fahrenheit)
Series1


Displacement of Membrane at 1 psig NASTRAN
Micrometers
13680
13700
13720
13740
13760
13780
13800
13820
13840
13860
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Volts (Equivalent Degrees Fahrenheit)
Series1

```
$ NASTRAN input file created by the MSC MSC/NASTRAN input file
$ translator ( MSC/PATRAN Version 8.5 ) on July      06, 2000 at
$ 12:55:22.
$ASSIGN OUTPUT2 = 'dinky.op2', UNIT = 12
$ Direct Text Input for File Management Section
$ Linear Static Analysis, Database
SOL 106
TIME 600
$ Direct Text Input for Executive Control
CEND
SEALL = ALL
SUPER = ALL
TITLE = LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE
ECHO = SORT
MAXLINES = 999999999
SET 45 = 1,2,3,4,5,6,7,8,9
DISP = 45
TEMP(INIT) = 1
$
$ Direct Text Input for Global Case Control Data
   SPC = 2
SUBCASE 4
LOAD = 33
LABEL = Small Mechanical Load
NLPARM = 108
$$$$
$$$Subcase 5
$$$TEMP(LOAD) = 55
$$$NLPARM=108
$$$LABEL = THERMAL LOADS AT 200
$stress=all
SUBCASE 10
    LOAD = 100
TEMP(LOAD) = 55
    LABEL = ONE TENTH, -50 DEG
    NLPARM = 108
SUBCASE 20
    LOAD = 200
TEMP(LOAD) = 55
    LABEL = TWO TENTHS, -50 DEG
    NLPARM = 108
SUBCASE 30
    LOAD = 300
TEMP(LOAD) = 55
    LABEL = THREE TENTHS, -50 DEG
    NLPARM = 108
SUBCASE 40
    LOAD = 400
TEMP(LOAD) = 55
    LABEL = FOUR TENTHS, -50 DEG
    NLPARM = 108
SUBCASE 50
    LOAD = 500
TEMP(LOAD) = 55
    LABEL = FIVE TENTHS, -50 DEG
    NLPARM = 108
SUBCASE 60
    LOAD = 600
TEMP(LOAD) = 55
    LABEL = SIX TENTHS, -50 DEG
    NLPARM = 108
SUBCASE 70
    LOAD = 700
TEMP(LOAD) = 55
    LABEL = SEVEN TENTHS, -50 DEG
    NLPARM = 108
SUBCASE 80
    LOAD = 800
TEMP(LOAD) = 55
    LABEL = EIGHT TENTHS, -50 DEG
    NLPARM = 108
SUBCASE 90
    LOAD = 900
TEMP(LOAD) = 55
    LABEL = NINE TENTHS, -50 DEG
    NLPARM = 108
SUBCASE 101
    LOAD = 1000
TEMP(LOAD) = 55
    LABEL = ONE, -50 DEG
    NLPARM = 108
$   TEMPERATURE(BOTH) = 2
$   DISPLACEMENT(SORT1,REAL)=ALL
$   SPCFORCES(SORT1,REAL)=ALL
$   STRESS(SORT1,REAL,VONMISES,BILIN)=ALL
$ Direct Text Input for this Subcase
BEGIN BULK
PARAM    POST    -1
PARAM    PATVER  3.
$PARAM    AUTOSPC YES
$PARAM    INREL   0
$PARAM    ALTRED  NO
PARAM   COUPMASS -1
PARAM,K6ROT,1000.
PARAM    WTMASS  1.
PARAM,NOCOMPS,-1
PARAM   PRTMAXIM YES
$ Direct Text Input for Bulk Data
$ Elements and Element Properties for region : membrane
```

```
$12345678901234567890123456789012345678901234567890
$234567890123456789012345678901234567890123456789012345678 90
PSHELL  1       1       .002047 1       1.25
$$PSHELL,1,1,0.002047,1,1.0
$ Pset: "membrane" will be imported as: "pshell.1"
CTRIA3  1       1       1       2       8
CQUAD4  2       1       2       3       9       8
CQUAD4  3       1       3       4       10      9
CQUAD4  4       1       4       5       11      10
CQUAD4  5       1       5       6       12      11
CQUAD4  6       1       6       7       13      12
CTRIA3  7       1       1       8       14
CQUAD4  8       1       8       9       15      14
CQUAD4  9       1       9       10      16      15
CQUAD4  10      1       10      11      17      16
CQUAD4  11      1       11      12      18      17
CQUAD4  12      1       12      13      19      18
CTRIA3  13      1       1       14      20
CQUAD4  14      1       14      15      21      20
CQUAD4  15      1       15      16      22      21
CQUAD4  16      1       16      17      23      22
CQUAD4  17      1       17      18      24      23
CQUAD4  18      1       18      19      25      24
CTRIA3  19      1       1       20      26
CQUAD4  20      1       20      21      27      26
CQUAD4  21      1       21      22      28      27
CQUAD4  22      1       22      23      29      28
CQUAD4  23      1       23      24      30      29
CQUAD4  24      1       24      25      31      30
CTRIA3  25      1       1       26      32
CQUAD4  26      1       26      27      33      32
CQUAD4  27      1       27      28      34      33
CQUAD4  28      1       28      29      35      34
CQUAD4  29      1       29      30      36      35
CQUAD4  30      1       30      31      37      36
CTRIA3  31      1       1       32      38
CQUAD4  32      1       32      33      39      38
CQUAD4  33      1       33      34      40      39
CQUAD4  34      1       34      35      41      40
CQUAD4  35      1       35      36      42      41
CQUAD4  36      1       36      37      43      42
CTRIA3  37      1       1       38      44
CQUAD4  38      1       38      39      45      44
CQUAD4  39      1       39      40      46      45
CQUAD4  40      1       40      41      47      46
CQUAD4  41      1       41      42      48      47
CQUAD4  42      1       42      43      49      48
CTRIA3  43      1       1       44      50
CQUAD4  44      1       44      45      51      50
CQUAD4  45      1       45      46      52      51
CQUAD4  46      1       46      47      53      52
CQUAD4  47      1       47      48      54      53
CQUAD4  48      1       48      49      55      54
CTRIA3  49      1       1       50      56
CQUAD4  50      1       50      51      57      56
CQUAD4  51      1       51      52      58      57
CQUAD4  52      1       52      53      59      58
CQUAD4  53      1       53      54      60      59
CQUAD4  54      1       54      55      61      60
CTRIA3  55      1       1       56      62
CQUAD4  56      1       56      57      63      62
CQUAD4  57      1       57      58      64      63
CQUAD4  58      1       58      59      65      64
CQUAD4  59      1       59      60      66      65
CQUAD4  60      1       60      61      67      66
CTRIA3  61      1       1       62      68
CQUAD4  62      1       62      63      69      68
CQUAD4  63      1       63      64      70      69
CQUAD4  64      1       64      65      71      70
CQUAD4  65      1       65      66      72      71
CQUAD4  66      1       66      67      73      72
CTRIA3  67      1       1       68      74
CQUAD4  68      1       68      69      75      74
CQUAD4  69      1       69      70      76      75
CQUAD4  70      1       70      71      77      76
CQUAD4  71      1       71      72      78      77
CQUAD4  72      1       72      73      79      78
CTRIA3  73      1       1       74      80
CQUAD4  74      1       74      75      81      80
CQUAD4  75      1       75      76      82      81
CQUAD4  76      1       76      77      83      82
CQUAD4  77      1       77      78      84      83
CQUAD4  78      1       78      79      85      84
CTRIA3  79      1       1       80      86
CQUAD4  80      1       80      81      87      86
CQUAD4  81      1       81      82      88      87
CQUAD4  82      1       82      83      89      88
CQUAD4  83      1       83      84      90      89
CQUAD4  84      1       84      85      91      90
CTRIA3  85      1       1       86      92
CQUAD4  86      1       86      87      93      92
CQUAD4  87      1       87      88      94      93
CQUAD4  88      1       88      89      95      94
CQUAD4  89      1       89      90      96      95
CQUAD4  90      1       90      91      97      96
CTRIA3  91      1       1       92      98
CQUAD4  92      1       92      93      99      98
CQUAD4  93      1       93      94      100     99
CQUAD4  94      1       94      95      101     100
```

CQUAD4	95	1	95	96	102	101
CQUAD4	96	1	96	97	103	102
CTRIA3	97	1	1	98	104	
CQUAD4	98	1	98	99	105	104
CQUAD4	99	1	99	100	106	105
CQUAD4	100	1	100	101	107	106
CQUAD4	101	1	101	102	108	107
CQUAD4	102	1	102	103	109	108
CTRIA3	103	1	1	104	110	
CQUAD4	104	1	104	105	111	110
CQUAD4	105	1	105	106	112	111
CQUAD4	106	1	106	107	113	112
CQUAD4	107	1	107	108	114	113
CQUAD4	108	1	108	109	115	114
CTRIA3	109	1	1	110	116	
CQUAD4	110	1	110	111	117	116
CQUAD4	111	1	111	112	118	117
CQUAD4	112	1	112	113	119	118
CQUAD4	113	1	113	114	120	119
CQUAD4	114	1	114	115	121	120
CTRIA3	115	1	1	116	122	
CQUAD4	116	1	116	117	123	122
CQUAD4	117	1	117	118	124	123
CQUAD4	118	1	118	119	125	124
CQUAD4	119	1	119	120	126	125
CQUAD4	120	1	120	121	127	126
CTRIA3	121	1	1	122	128	
CQUAD4	122	1	122	123	129	128
CQUAD4	123	1	123	124	130	129
CQUAD4	124	1	124	125	131	130
CQUAD4	125	1	125	126	132	131
CQUAD4	126	1	126	127	133	132
CTRIA3	127	1	1	128	134	
CQUAD4	128	1	128	129	135	134
CQUAD4	129	1	129	130	136	135
CQUAD4	130	1	130	131	137	136
CQUAD4	131	1	131	132	138	137
CQUAD4	132	1	132	133	139	138
CTRIA3	133	1	1	134	140	
CQUAD4	134	1	134	135	141	140
CQUAD4	135	1	135	136	142	141
CQUAD4	136	1	136	137	143	142
CQUAD4	137	1	137	138	144	143
CQUAD4	138	1	138	139	145	144
CTRIA3	139	1	1	140	146	
CQUAD4	140	1	140	141	147	146
CQUAD4	141	1	141	142	148	147
CQUAD4	142	1	142	143	149	148
CQUAD4	143	1	143	144	150	149
CQUAD4	144	1	144	145	151	150
CTRIA3	145	1	1	146	152	
CQUAD4	146	1	146	147	153	152
CQUAD4	147	1	147	148	154	153
CQUAD4	148	1	148	149	155	154
CQUAD4	149	1	149	150	156	155
CQUAD4	150	1	150	151	157	156
CTRIA3	151	1	1	152	158	
CQUAD4	152	1	152	153	159	158
CQUAD4	153	1	153	154	160	159
CQUAD4	154	1	154	155	161	160
CQUAD4	155	1	155	156	162	161
CQUAD4	156	1	156	157	163	162
CTRIA3	157	1	1	158	164	
CQUAD4	158	1	158	159	165	164
CQUAD4	159	1	159	160	166	165
CQUAD4	160	1	160	161	167	166
CQUAD4	161	1	161	162	168	167
CQUAD4	162	1	162	163	169	168
CTRIA3	163	1	1	164	170	
CQUAD4	164	1	164	165	171	170
CQUAD4	165	1	165	166	172	171
CQUAD4	166	1	166	167	173	172
CQUAD4	167	1	167	168	174	173
CQUAD4	168	1	168	169	175	174
CTRIA3	169	1	1	170	176	
CQUAD4	170	1	170	171	177	176
CQUAD4	171	1	171	172	178	177
CQUAD4	172	1	172	173	179	178
CQUAD4	173	1	173	174	180	179
CQUAD4	174	1	174	175	181	180
CTRIA3	175	1	1	176	182	
CQUAD4	176	1	176	177	183	182
CQUAD4	177	1	177	178	184	183
CQUAD4	178	1	178	179	185	184
CQUAD4	179	1	179	180	186	185
CQUAD4	180	1	180	181	187	186
CTRIA3	181	1	1	182	188	
CQUAD4	182	1	182	183	189	188
CQUAD4	183	1	183	184	190	189
CQUAD4	184	1	184	185	191	190
CQUAD4	185	1	185	186	192	191
CQUAD4	186	1	186	187	193	192
CTRIA3	187	1	1	188	194	
CQUAD4	188	1	188	189	195	194
CQUAD4	189	1	189	190	196	195
CQUAD4	190	1	190	191	197	196
CQUAD4	191	1	191	192	198	197
CQUAD4	192	1	192	193	199	198
CTRIA3	193	1	1	194	200	

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CQUAD4  194     1       194     195     201     200
CQUAD4  195     1       195     196     202     201
CQUAD4  196     1       196     197     203     202
CQUAD4  197     1       197     198     204     203
CQUAD4  198     1       198     199     205     204
CTRIA3  199     1       1       200     206
CQUAD4  200     1       200     201     207     206
CQUAD4  201     1       201     202     208     207
CQUAD4  202     1       202     203     209     208
CQUAD4  203     1       203     204     210     209
CQUAD4  204     1       204     205     211     210
CTRIA3  205     1       1       206     212
CQUAD4  206     1       206     207     213     212
CQUAD4  207     1       207     208     214     213
CQUAD4  208     1       208     209     215     214
CQUAD4  209     1       209     210     216     215
CQUAD4  210     1       210     211     217     216
CTRIA3  211     1       1       212     218
CQUAD4  212     1       212     213     219     218
CQUAD4  213     1       213     214     220     219
CQUAD4  214     1       214     215     221     220
CQUAD4  215     1       215     216     222     221
CQUAD4  216     1       216     217     223     222
$ Referenced Material Records
$ Material Record : kynar
$ Description of Material : Date: 01-Jun-00          Time: 15:44:27
$MAT1    1       580156.         .387    .064307 2.498-7 0.
MAT1    1       537500.         .387    .064307 2.498-7 0.
$ Nodes of the Entire Model
GRID    1               0.      0.      0.
GRID    2               .708333 0.      0.
GRID    3               1.41666 0.      0.
GRID    4               2.125   0.      0.
GRID    5               2.83333 0.      0.
GRID    6               3.54166 0.      0.
GRID    7               4.25    0.      0.
GRID    8               .697572 .123001 0.
GRID    9               1.39514 .246002 0.
GRID    10              2.09271 .369003 0.
GRID    11              2.79028 .492005 0.
GRID    12              3.48786 .615007 0.
GRID    13              4.18543 .738009 0.
GRID    14              .665615 .242264 0.
GRID    15              1.33123 .484529 0.
GRID    16              1.99684 .726795 0.
GRID    17              2.66246 .969061 0.
GRID    18              3.32807 1.21132 0.
GRID    19              3.99369 1.45359 0.
GRID    20              .613434 .354167 0.
GRID    21              1.22686 .708335 0.
GRID    22              1.84030 1.06250 0.
GRID    23              2.45373 1.41667 0.
GRID    24              3.06716 1.77084 0.
GRID    25              3.68060 2.12501 0.
GRID    26              .542615 .455308 0.
GRID    27              1.08522 .910617 0.
GRID    28              1.62784 1.36592 0.
GRID    29              2.17045 1.82123 0.
GRID    30              2.71306 2.27654 0.
GRID    31              3.25567 2.73186 0.
GRID    32              .455307 .542615 0.
GRID    33              .910614 1.08523 0.
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GRID    35              1.82122 2.17046 0.
GRID    36              2.27652 2.71308 0.
GRID    37              2.73183 3.25570 0.
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GRID    39              .708331 1.22687 0.
GRID    40              1.06249 1.84030 0.
GRID    41              1.41665 2.45374 0.
GRID    42              1.77081 3.06718 0.
GRID    43              2.12497 3.68062 0.
GRID    44              .242263 .665616 0.
GRID    45              .484526 1.33123 0.
GRID    46              .726786 1.99684 0.
GRID    47              .969045 2.66246 0.
GRID    48              1.21130 3.32808 0.
GRID    49              1.45356 3.99370 0.
GRID    50              .123    .697572 0.
GRID    51              .245998 1.39514 0.
GRID    52              .368994 2.09271 0.
GRID    53              .491989 2.79029 0.
GRID    54              .614982 3.48786 0.
GRID    55              .737973 4.18543 0.
GRID    56             -1.092-6 .708333 0.
GRID    57             -4.041-6 1.41666 0.
GRID    58             -8.846-6 2.125   0.
GRID    59             -1.604-5 2.83333 0.
GRID    60             -2.469-5 3.54166 0.
GRID    61             -3.599-5 4.25    0.
GRID    62             -.123002 .697572 0.
GRID    63             -.246006 1.39514 0.
GRID    64             -.369012 2.09271 0.
GRID    65             -.492021 2.79028 0.
GRID    66             -.615032 3.48785 0.
GRID    67             -.738045 4.18542 0.
GRID    68             -.242265 .665615 0.
GRID    69             -.484533 1.33123 0.
GRID    70             -.726803 1.99684 0.
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GRID     71             -.969076 2.66245 0.
GRID     72             -1.21135 3.32806 0.
GRID     73             -1.45362 3.99367 0.
GRID     74             -.354168 .613434 0.
GRID     75             -.708338 1.22686 0.
GRID     76             -1.06251 1.84029 0.
GRID     77             -1.41668 2.45372 0.
GRID     78             -1.77086 3.06715 0.
GRID     79             -2.12504 3.68058 0.
GRID     80             -.455309 .542614 0.
GRID     81             -.91062  1.08522 0.
GRID     82             -1.36593 1.62783 0.
GRID     83             -1.82124 2.17044 0.
GRID     84             -2.27656 2.71305 0.
GRID     85             -2.73188 3.25565 0.
GRID     86             -.542616 .455307 0.
GRID     87             -1.08523 .910611 0.
GRID     88             -1.62785 1.36591 0.
GRID     89             -2.17047 1.82121 0.
GRID     90             -2.71309 2.27651 0.
GRID     91             -3.25572 2.73180 0.
GRID     92             -.613435 .354165 0.
GRID     93             -1.22687 .708328 0.
GRID     94             -1.84031 1.06248 0.
GRID     95             -2.45375 1.41664 0.
GRID     96             -3.06719 1.77079 0.
GRID     97             -3.68063 2.12494 0.
GRID     98             -.665616 .242263 0.
GRID     99             -1.33123 .484522 0.
GRID     100            -1.99685 .726778 0.
GRID     101            -2.66247 .96903  0.
GRID     102            -3.32809 1.21128 0.
GRID     103            -3.99371 1.45352 0.
GRID     104            -.697572 .122999 0.
GRID     105            -1.39514 .245994 0.
GRID     106            -2.09271 .368986 0.
GRID     107            -2.79029 .491973 0.
GRID     108            -3.48786 .614958 0.
GRID     109            -4.18544 .737938 0.
GRID     110            -.708333-2.184-6 0.
GRID     111            -1.41666-8.082-6 0.
GRID     112            -2.125   -1.769-5 0.
GRID     113            -2.83333-3.208-5 0.
GRID     114            -3.54166-4.938-5 0.
GRID     115            -4.25    -7.199-5 0.
GRID     116            -.697572-.123003 0.
GRID     117            -1.39514-.24601  0.
GRID     118            -2.09271-.369022 0.
GRID     119            -2.79028-.492036 0.
GRID     120            -3.48785-.615055 0.
GRID     121            -4.18542-.738079 0.
GRID     122            -.665615-.242266 0.
GRID     123            -1.33122-.484537 0.
GRID     124            -1.99684-.726812 0.
GRID     125            -2.66245-.969091 0.
GRID     126            -3.32805-1.21137 0.
GRID     127            -3.99366-1.45366 0.
GRID     128            -.613433-.354169 0.
GRID     129            -1.22686-.708341 0.
GRID     130            -1.84029-1.06251 0.
GRID     131            -2.45372-1.41669 0.
GRID     132            -3.06714-1.77088 0.
GRID     133            -3.68056-2.12507 0.
GRID     134            -.542613-.45531  0.
GRID     135            -1.08522-.910623 0.
GRID     136            -1.62783-1.36594 0.
GRID     137            -2.17043-1.82126 0.
GRID     138            -2.71303-2.27658 0.
GRID     139            -3.25563-2.73191 0.
GRID     140            -.455306-.542617 0.
GRID     141            -.910608-1.08523 0.
GRID     142            -1.36590-1.62785 0.
GRID     143            -1.8212 -2.17048 0.
GRID     144            -2.27649-2.71311 0.
GRID     145            -2.73177-3.25574 0.
GRID     146            -.354164-.613436 0.
GRID     147            -.708324-1.22687 0.
GRID     148            -1.06247-1.84031 0.
GRID     149            -1.41662-2.45376 0.
GRID     150            -1.77077-3.06720 0.
GRID     151            -2.12491-3.68065 0.
GRID     152            -.242262-.665617 0.
GRID     153            -.484518-1.33123 0.
GRID     154            -.726769-1.99685 0.
GRID     155            -.969015-2.66247 0.
GRID     156            -1.21125-3.32810 0.
GRID     157            -1.45349-3.99372 0.
GRID     158            -.122998-.697573 0.
GRID     159            -.24599 -1.39514 0.
GRID     160            -.368977-2.09272 0.
GRID     161            -.491958-2.79029 0.
GRID     162            -.614933-3.48787 0.
GRID     163            -.737903-4.18545 0.
GRID     164             3.010-6-.708333 0.
GRID     165             1.185-5-1.41666 0.
GRID     166             2.654-5-2.125   0.
GRID     167             4.706-5-2.83333 0.
GRID     168             7.341-5-3.54166 0.
GRID     169             1.056-4-4.25    0.
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GRID    170             .123004-.697572 0.
GRID    171             .246014-1.39514 0.
GRID    172             .369029-2.09271 0.
GRID    173             .492052-2.79028 0.
GRID    174             .615079-3.48784 0.
GRID    175             .738114-4.18541 0.
GRID    176             .242267-.665614 0.
GRID    177             .484541-1.33122 0.
GRID    178             .72682 -1.99683 0.
GRID    179             .969105-2.66244 0.
GRID    180             1.21139-3.32805 0.
GRID    181             1.45369-3.99365 0.
GRID    182             .354169-.613433 0.
GRID    183             .708345-1.22686 0.
GRID    184             1.06252-1.84028 0.
GRID    185             1.41671-2.45371 0.
GRID    186             1.77090-3.06713 0.
GRID    187             2.12510-3.68054 0.
GRID    188             .455311-.542613 0.
GRID    189             .910626-1.08522 0.
GRID    190             1.36594-1.62782 0.
GRID    191             1.82127-2.17042 0.
GRID    192             2.27660-2.71302 0.
GRID    193             2.73194-3.25561 0.
GRID    194             .542617-.455305 0.
GRID    195             1.08523-.910605 0.
GRID    196             1.62786-1.3659  0.
GRID    197             2.17049-1.82118 0.
GRID    198             2.71313-2.27647 0.
GRID    199             3.25576-2.73175 0.
GRID    200             .613437-.354163 0.
GRID    201             1.22687-.708321 0.
GRID    202             1.84032-1.06247 0.
GRID    203             2.45376-1.41661 0.
GRID    204             3.06721-1.77075 0.
GRID    205             3.68067-2.12488 0.
GRID    206             .665617-.242261 0.
GRID    207             1.33123-.484515 0.
GRID    208             1.99685-.726761 0.
GRID    209             2.66248-.969002 0.
GRID    210             3.32810-1.21123 0.
GRID    211             3.99373-1.45346 0.
GRID    212             .697573-.122997 0.
GRID    213             1.39514-.245986 0.
GRID    214             2.09272-.368968 0.
GRID    215             2.79029-.491943 0.
GRID    216             3.48787-.61491  0.
GRID    217             4.18545-.73787  0.
GRID    218             .708333 1.238-7 0.
GRID    219             1.41666 2.476-7 0.
GRID    220             2.125   3.715-7 0.
GRID    221             2.83333 4.953-7 0.
GRID    222             3.54166 6.192-7 0.
GRID    223             4.25    7.430-7 0.
$ Loads for Load Case : loadcase1
$SPCADD  2       1
$2345678901234567890123456789012345678901234567890
LOAD    100     1.      1.      10
LOAD    33      1.      1.      11
LOAD    200     1.      1.      20
LOAD    300     1.      1.      30
LOAD    400     1.      1.      40
LOAD    500     1.      1.      50
LOAD    600     1.      1.      60
LOAD    700     1.      1.      70
LOAD    800     1.      1.      80
LOAD    900     1.      1.      90
LOAD    1000    1.      1.      101
PLOAD4  11      1       .10                                     THRU    216
PLOAD4  10      1       .1                                      THRU    216
PLOAD4  20      1       .2                                      THRU    216
PLOAD4  30      1       .3                                      THRU    216
PLOAD4  40      1       .4                                      THRU    216
PLOAD4  50      1       .5                                      THRU    216
PLOAD4  60      1       .6                                      THRU    216
PLOAD4  70      1       .7                                      THRU    216
PLOAD4  80      1       .8                                      THRU    216
PLOAD4  90      1       .9                                      THRU    216
PLOAD4  101     1       1.0                                     THRU    216
$ Static Plate Element Temperatures of Load Set : temperature
TEMPD   1       0
TEMPD,55,-50.0
$+      A 2     THRU    216
$ Displacement Constraints of Load Set : constraint
SPC1    2       123456  7       13      19      25      31      37      +       B
+       B 43    49      55      61      67      73      79      85      +       C
+       C 91    97      103     109     115     121     127     133     +       D
+       D 139   145     151     157     163     169     175     181     +       E
+       E 187   193     199     205     211     217     223
$ Pressure Loads of Load Set : pressure.1
PARAM,LGDISP,1
NLPARM,108,20
$NLPARM,107,8,,ITER
$ Referenced Coordinate Frames
ENDDATA
```

ONE TENTH, ZERO DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.341992E-03	7.401508E-08	2.133318E-01	4.767032E-06	-3.194503E-03	-5.698712E-07
2	G	3.587988E-03	7.349566E-03	2.514677E-01	-1.103176E-01	-1.476892E-02	5.080811E-03
3	G	4.534828E-03	8.846126E-03	2.499020E-01	-8.563810E-02	1.971927E-02	6.239635E-04
4	G	5.228249E-03	8.234358E-03	2.196153E-01	-6.538023E-02	7.205004E-02	-2.608204E-03
5	G	4.716984E-03	6.243060E-03	1.661580E-01	-4.700415E-02	6.834459E-02	-2.289620E-03
6	G	2.905966E-03	3.391708E-03	9.238727E-02	-5.754874E-02	1.687762E-01	-6.500938E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.094946E-03	6.582240E-03	2.393183E-01	-8.740198E-02	-2.736874E-02	6.174818E-03
9	G	3.969544E-03	7.959296E-03	2.311131E-01	-6.769782E-02	2.627526E-02	3.668207E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, ZERO DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.699800E-03	1.900756E-07	2.688976E-01	1.839473E-05	1.517781E-02	-1.255206E-06
2	G	5.657619E-03	1.171388E-02	3.170216E-01	-1.449520E-01	-1.793619E-02	7.857751E-03
3	G	7.199376E-03	1.407835E-02	3.150148E-01	-1.108159E-01	2.398902E-02	1.075015E-03
4	G	8.308156E-03	1.309270E-02	2.767770E-01	-8.485006E-02	9.233310E-02	-4.319508E-03
5	G	7.475621E-03	9.907982E-03	2.091379E-01	-5.601881E-02	8.507415E-02	-3.609077E-03
6	G	4.664267E-03	5.411784E-03	1.167564E-01	-7.577603E-02	2.122634E-01	-1.049676E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.905153E-03	1.043558E-02	3.012488E-01	-1.115717E-01	-3.500446E-02	9.848427E-03
9	G	6.283277E-03	1.261670E-02	2.908130E-01	-8.601391E-02	3.350478E-02	5.465528E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, ZERO DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.827071E-03	3.296506E-07	3.079243E-01	3.776644E-05	3.347854E-02	-1.804291E-06
2	G	7.381059E-03	1.537338E-02	3.629159E-01	-1.692394E-01	-2.032832E-02	1.019281E-02
3	G	9.427924E-03	1.846821E-02	3.606077E-01	-1.285687E-01	2.704221E-02	1.458444E-03
4	G	1.088789E-02	1.716879E-02	3.168018E-01	-9.846851E-02	1.064855E-01	-5.772921E-03
5	G	9.785834E-03	1.298225E-02	2.392366E-01	-6.223028E-02	9.684050E-02	-4.719901E-03
6	G	6.145012E-03	7.111489E-03	1.338336E-01	-8.868869E-02	2.424940E-01	-1.388027E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.415361E-03	1.365929E-02	3.446157E-01	-1.283657E-01	-4.029152E-02	1.293319E-02
9	G	8.215570E-03	1.651759E-02	3.326161E-01	-9.873720E-02	3.847246E-02	7.060374E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, ZERO DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.824279E-03	4.875732E-07	3.390261E-01	6.160066E-05	5.096036E-02	-2.113337E-06
2	G	8.910754E-03	1.863601E-02	3.993870E-01	-1.884515E-01	-2.228624E-02	1.228464E-02
3	G	1.141145E-02	2.238498E-02	3.968402E-01	-1.426764E-01	2.949344E-02	1.803628E-03
4	G	1.318708E-02	2.080704E-02	3.486135E-01	-1.092386E-01	1.176858E-01	-7.074701E-03
5	G	1.184594E-02	1.572718E-02	2.631682E-01	-6.716432E-02	1.062277E-01	-5.714348E-03
6	G	7.469765E-03	8.631983E-03	1.474169E-01	-9.904365E-02	2.663847E-01	-1.692065E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.756472E-03	1.653108E-02	3.790943E-01	-1.416347E-01	-4.442729E-02	1.568392E-02
9	G	9.934303E-03	1.999619E-02	3.658510E-01	-1.087726E-01	4.236004E-02	8.567687E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, ZERO DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.733309E-03	6.604511E-07	3.653156E-01	8.914154E-05	6.754070E-02	-2.123406E-06
2	G	1.030995E-02	2.163025E-02	4.301342E-01	-2.045407E-01	-2.394332E-02	1.421139E-02
3	G	1.322947E-02	2.598237E-02	4.273852E-01	-1.545321E-01	3.156491E-02	2.124286E-03
4	G	1.529706E-02	2.415056E-02	3.754366E-01	-1.182674E-01	1.270934E-01	-8.271642E-03
5	G	1.373792E-02	1.825094E-02	2.833554E-01	-7.133682E-02	1.141674E-01	-6.630572E-03
6	G	8.689254E-03	1.003195E-02	1.588780E-01	-1.078429E-01	2.864297E-01	-1.973036E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.983096E-03	1.916613E-02	4.081779E-01	-1.527627E-01	-4.784866E-02	1.820671E-02
9	G	1.150918E-02	2.319106E-02	3.938858E-01	-1.171724E-01	4.559385E-02	1.002825E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, ZERO DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.576771E-03	8.463200E-07	3.883161E-01	1.198958E-04	8.326672E-02	-1.794408E-06
2	G	1.161256E-02	2.442559E-02	4.569698E-01	-2.184867E-01	-2.537364E-02	1.601396E-02
3	G	1.492490E-02	2.934340E-02	4.540426E-01	-1.648382E-01	3.336866E-02	2.427868E-03
4	G	1.726710E-02	2.727639E-02	3.988505E-01	-1.261049E-01	1.352782E-01	-9.389993E-03
5	G	1.550585E-02	2.061162E-02	3.009839E-01	-7.499430E-02	1.211151E-01	-7.488977E-03
6	G	9.830929E-03	1.134300E-02	1.688890E-01	-1.155808E-01	3.038500E-01	-2.237032E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.012471E-02	2.162636E-02	4.335753E-01	-1.624303E-01	-5.077100E-02	2.055860E-02
9	G	1.297765E-02	2.617656E-02	4.183674E-01	-1.244550E-01	4.838090E-02	1.146241E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, ZERO DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.368637E-03	1.043875E-06	4.089008E-01	1.534995E-04	9.821242E-02	-1.097446E-06
2	G	1.283945E-02	2.706503E-02	4.809326E-01	-2.308585E-01	-2.662448E-02	1.771732E-02
3	G	1.652423E-02	3.251937E-02	4.778447E-01	-1.740040E-01	3.497084E-02	2.718891E-03
4	G	1.912758E-02	3.023202E-02	4.197606E-01	-1.330689E-01	1.425671E-01	-1.044636E-02
5	G	1.717687E-02	2.284497E-02	3.167335E-01	-7.827581E-02	1.273323E-01	-8.302107E-03
6	G	1.091176E-02	1.258460E-02	1.778352E-01	-1.225415E-01	3.193446E-01	-2.487816E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.119955E-02	2.394984E-02	4.562658E-01	-1.710281E-01	-5.331921E-02	2.277482E-02
9	G	1.436278E-02	2.899843E-02	4.402396E-01	-1.309180E-01	5.083937E-02	1.288188E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, ZERO DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.118314E-03	1.252067E-06	4.276222E-01	1.896795E-04	1.124524E-01	-1.115805E-08
2	G	1.400462E-02	2.957748E-02	5.026800E-01	-2.420164E-01	-2.772826E-02	1.933831E-02
3	G	1.804524E-02	3.554473E-02	4.994448E-01	-1.822887E-01	3.641428E-02	3.000361E-03
4	G	2.089888E-02	3.304930E-02	4.387399E-01	-1.393600E-01	1.491668E-01	-1.145202E-02
5	G	1.876916E-02	2.497493E-02	3.310342E-01	-8.126815E-02	1.329847E-01	-9.078379E-03
6	G	1.194312E-02	1.376981E-02	1.859604E-01	-1.289042E-01	3.333558E-01	-2.727912E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.221985E-02	2.616216E-02	4.768688E-01	-1.788021E-01	-5.557397E-02	2.487925E-02
9	G	1.568006E-02	3.168732E-02	4.600995E-01	-1.367493E-01	5.304433E-02	1.429357E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, ZERO DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.832514E-03	1.470081E-06	4.448548E-01	2.282205E-04	1.260549E-01	1.480952E-06
2	G	1.511807E-02	3.198354E-02	5.226576E-01	-2.522050E-01	-2.870859E-02	2.088898E-02
3	G	1.950064E-02	3.844401E-02	5.192854E-01	-1.898682E-01	3.772863E-02	3.274368E-03
4	G	2.259555E-02	3.575092E-02	4.561765E-01	-1.451146E-01	1.552172E-01	-1.241510E-02
5	G	2.029565E-02	2.701854E-02	3.441771E-01	-8.402963E-02	1.381845E-01	-9.823789E-03
6	G	1.293314E-02	1.490792E-02	1.934295E-01	-1.347904E-01	3.461829E-01	-2.959114E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.319438E-02	2.828150E-02	4.958042E-01	-1.859184E-01	-5.759095E-02	2.688901E-02
9	G	1.694051E-02	3.426507E-02	4.783516E-01	-1.420764E-01	5.504677E-02	1.570176E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, ZERO DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.051625E-02	1.697254E-06	4.608655E-01	2.689482E-04	1.390801E-01	3.391936E-06
2	G	1.618723E-02	3.429857E-02	5.411828E-01	-2.615984E-01	-2.958344E-02	2.237843E-02
3	G	2.089988E-02	4.123551E-02	5.376822E-01	-1.968684E-01	3.893548E-02	3.542423E-03
4	G	2.422840E-02	3.835374E-02	4.723471E-01	-1.504295E-01	1.608177E-01	-1.334169E-02
5	G	2.176594E-02	2.898846E-02	3.563698E-01	-8.660164E-02	1.430123E-01	-1.054280E-02
6	G	1.388785E-02	1.600586E-02	2.003604E-01	-1.402865E-01	3.580391E-01	-3.182759E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.412965E-02	3.032140E-02	5.133712E-01	-1.924952E-01	-5.941056E-02	2.881701E-02
9	G	1.815236E-02	3.674791E-02	4.952843E-01	-1.469900E-01	5.688317E-02	1.710918E-03

ONE TENTH, -50 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.340110E-03	7.428115E-08	2.128451E-01	4.820706E-06	-3.093266E-03	-5.687948E-07
2	G	3.573806E-03	7.377742E-03	2.511588E-01	-1.115135E-01	-1.483492E-02	5.071481E-03
3	G	4.521884E-03	8.881387E-03	2.496999E-01	-8.697136E-02	1.952435E-02	6.339154E-04
4	G	5.216466E-03	8.264905E-03	2.194424E-01	-6.612002E-02	7.222390E-02	-2.638099E-03
5	G	4.708288E-03	6.271722E-03	1.660596E-01	-4.742451E-02	6.795779E-02	-2.273157E-03
6	G	2.902673E-03	3.413449E-03	9.238085E-02	-5.830716E-02	1.688848E-01	-6.558518E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.085376E-03	6.596376E-03	2.388850E-01	-8.812183E-02	-2.740703E-02	6.182708E-03
9	G	3.952518E-03	7.971100E-03	2.306560E-01	-6.821154E-02	2.621001E-02	3.656474E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -50 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT. ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.695489E-03	1.901606E-07	2.684774E-01	1.843426E-05	1.522711E-02	-1.252465E-06
2	G	5.646479E-03	1.172431E-02	3.166179E-01	-1.450697E-01	-1.782726E-02	7.848052E-03
3	G	7.180028E-03	1.409234E-02	3.146470E-01	-1.108860E-01	2.377016E-02	1.094783E-03
4	G	8.284997E-03	1.310903E-02	2.764712E-01	-8.492364E-02	9.239355E-02	-4.330716E-03
5	G	7.455591E-03	9.927552E-03	2.089401E-01	-5.601626E-02	8.470047E-02	-3.592703E-03
6	G	4.654681E-03	5.430381E-03	1.166949E-01	-7.620370E-02	2.122201E-01	-1.053437E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.893503E-03	1.044339E-02	3.008387E-01	-1.116107E-01	-3.509798E-02	9.864526E-03
9	G	6.264481E-03	1.262562E-02	2.904265E-01	-8.607171E-02	3.352496E-02	5.432384E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -50 DEG SUBCASE 30
LOAD STEP = 4.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.822721E-03	3.299782E-07	3.075567E-01	3.783335E-05	3.353043E-02	-1.799412E-06
2	G	7.369811E-03	1.538384E-02	3.625630E-01	-1.693538E-01	-2.022869E-02	1.018174E-02
3	G	9.408536E-03	1.848219E-02	3.602862E-01	-1.286347E-01	2.684639E-02	1.478984E-03
4	G	1.086471E-02	1.718508E-02	3.165345E-01	-9.854170E-02	1.065437E-01	-5.785028E-03
5	G	9.765700E-03	1.300166E-02	2.390625E-01	-6.221803E-02	9.651127E-02	-4.703567E-03
6	G	6.135495E-03	7.130122E-03	1.337804E-01	-8.906911E-02	2.424554E-01	-1.391827E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.403677E-03	1.366700E-02	3.442564E-01	-1.284023E-01	-4.037400E-02	1.294937E-02
9	G	8.196723E-03	1.652636E-02	3.322772E-01	-9.879033E-02	3.849163E-02	7.025059E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -50 DEG SUBCASE 40
LOAD STEP = 5.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.819908E-03	4.878975E-07	3.386915E-01	6.168208E-05	5.101324E-02	-2.106644E-06
2	G	8.899365E-03	1.864665E-02	3.990668E-01	-1.885721E-01	-2.219472E-02	1.227260E-02
3	G	1.139207E-02	2.239911E-02	3.965490E-01	-1.427500E-01	2.931394E-02	1.824474E-03
4	G	1.316395E-02	2.082337E-02	3.483711E-01	-1.093134E-01	1.177421E-01	-7.087563E-03
5	G	1.182582E-02	1.574654E-02	2.630098E-01	-6.714895E-02	1.059271E-01	-5.698006E-03
6	G	7.460356E-03	8.650656E-03	1.473690E-01	-9.939503E-02	2.663496E-01	-1.695908E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.744778E-03	1.653871E-02	3.787669E-01	-1.416744E-01	-4.450060E-02	1.569982E-02
9	G	9.915403E-03	2.000480E-02	3.655417E-01	-1.088242E-01	4.237664E-02	8.532427E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -50 DEG SUBCASE 50
LOAD STEP = 6.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.728907E-03	6.608419E-07	3.650045E-01	8.924057E-05	6.759333E-02	-2.114550E-06
2	G	1.029848E-02	2.164088E-02	4.298367E-01	-2.046583E-01	-2.385704E-02	1.419874E-02
3	G	1.321006E-02	2.599648E-02	4.271145E-01	-1.546037E-01	3.139688E-02	2.145426E-03
4	G	1.527392E-02	2.416683E-02	3.752113E-01	-1.183401E-01	1.271475E-01	-8.284899E-03
5	G	1.371773E-02	1.827020E-02	2.832076E-01	-7.131873E-02	1.138874E-01	-6.614246E-03
6	G	8.679868E-03	1.005063E-02	1.588336E-01	-1.081717E-01	2.863965E-01	-1.976893E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.971375E-03	1.917369E-02	4.078732E-01	-1.528009E-01	-4.791618E-02	1.822251E-02
9	G	1.149023E-02	2.319956E-02	3.935978E-01	-1.172212E-01	4.560918E-02	9.992832E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -50 DEG SUBCASE 60
LOAD STEP = 7.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.572337E-03	8.467820E-07	3.880230E-01	1.200103E-04	8.331862E-02	-1.783222E-06
2	G	1.160104E-02	2.443619E-02	4.566893E-01	-2.186005E-01	-2.529143E-02	1.600087E-02
3	G	1.490546E-02	2.935746E-02	4.537874E-01	-1.649071E-01	3.320949E-02	2.449239E-03
4	G	1.724393E-02	2.729259E-02	3.986380E-01	-1.261755E-01	1.353302E-01	-9.403517E-03
5	G	1.548560E-02	2.063078E-02	3.008443E-01	-7.497447E-02	1.208511E-01	-7.472665E-03
6	G	9.821549E-03	1.136167E-02	1.688472E-01	-1.158920E-01	3.038180E-01	-2.240897E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.011296E-02	2.163383E-02	4.332880E-01	-1.624668E-01	-5.083411E-02	2.057432E-02
9	G	1.295867E-02	2.618497E-02	4.180957E-01	-1.245012E-01	4.839526E-02	1.142697E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -50 DEG SUBCASE 70
LOAD STEP = 8.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.364175E-03	1.044396E-06	4.086220E-01	1.536290E-04	9.826335E-02	-1.083836E-06
2	G	1.282787E-02	2.707558E-02	4.806656E-01	-2.309684E-01	-2.654559E-02	1.770389E-02
3	G	1.650475E-02	3.253337E-02	4.776019E-01	-1.740701E-01	3.481886E-02	2.740447E-03
4	G	1.910436E-02	3.024815E-02	4.195584E-01	-1.331373E-01	1.426173E-01	-1.046007E-02
5	G	1.715656E-02	2.286404E-02	3.166003E-01	-7.825480E-02	1.270811E-01	-8.285803E-03
6	G	1.090237E-02	1.260325E-02	1.777954E-01	-1.228383E-01	3.193135E-01	-2.491684E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.118777E-02	2.395725E-02	4.559923E-01	-1.710629E-01	-5.337878E-02	2.279046E-02
9	G	1.434376E-02	2.900675E-02	4.399810E-01	-1.309619E-01	5.085292E-02	1.284652E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -50 DEG SUBCASE 80
LOAD STEP = 9.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.113822E-03	1.252646E-06	4.273553E-01	1.898231E-04	1.125023E-01	4.977331E-09
2	G	1.399301E-02	2.958797E-02	5.024242E-01	-2.421227E-01	-2.765216E-02	1.932460E-02
3	G	1.802573E-02	3.555866E-02	4.992120E-01	-1.823522E-01	3.626829E-02	3.022067E-03
4	G	2.087563E-02	3.306536E-02	4.385461E-01	-1.394264E-01	1.492154E-01	-1.146588E-02
5	G	1.874879E-02	2.499392E-02	3.309062E-01	-8.124633E-02	1.327440E-01	-9.062080E-03
6	G	1.193373E-02	1.378845E-02	1.859221E-01	-1.291890E-01	3.333254E-01	-2.731781E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.220805E-02	2.616949E-02	4.766067E-01	-1.788354E-01	-5.563058E-02	2.489480E-02
9	G	1.566101E-02	3.169556E-02	4.598516E-01	-1.367913E-01	5.305718E-02	1.425836E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -50 DEG SUBCASE 90
LOAD STEP = 1.00000E+01

D I S P L A C E M E N T V E C T O F

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.827995E-03	1.470714E-06	4.445979E-01	2.283776E-04	1.261036E-01	1.499701E-06
2	G	1.510642E-02	3.199397E-02	5.224112E-01	-2.523078E-01	-2.863491E-02	2.087505E-02
3	G	1.948109E-02	3.845786E-02	5.190611E-01	-1.899295E-01	3.758777E-02	3.296199E-03
4	G	2.257226E-02	3.576690E-02	4.559897E-01	-1.451791E-01	1.552642E-01	-1.242907E-02
5	G	2.027521E-02	2.703745E-02	3.440535E-01	-8.400726E-02	1.379530E-01	-9.807492E-03
6	G	1.292373E-02	1.492654E-02	1.933926E-01	-1.350649E-01	3.461531E-01	-2.962984E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.318255E-02	2.828877E-02	4.955517E-01	-1.859503E-01	-5.764504E-02	2.690448E-02
9	G	1.692144E-02	3.427324E-02	4.781128E-01	-1.421166E-01	5.505901E-02	1.566675E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -50 DEG SUBCASE 101
LOAD STEP = 1.10000E+01

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.051170E-02	1.697941E-06	4.606173E-01	2.691182E-04	1.391278E-01	3.413375E-06
2	G	1.617554E-02	3.430895E-02	5.409444E-01	-2.616982E-01	-2.951188E-02	2.236431E-02
3	G	2.088029E-02	4.124929E-02	5.374652E-01	-1.969276E-01	3.879909E-02	3.564358E-03
4	G	2.420507E-02	3.836966E-02	4.721664E-01	-1.504922E-01	1.608635E-01	-1.335573E-02
5	G	2.174545E-02	2.900730E-02	3.562501E-01	-8.657888E-02	1.427885E-01	-1.052650E-02
6	G	1.387843E-02	1.602445E-02	2.003246E-01	-1.405521E-01	3.580098E-01	-3.186629E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.411779E-02	3.032861E-02	5.131269E-01	-1.925259E-01	-5.946245E-02	2.883240E-02
9	G	1.813325E-02	3.675601E-02	4.950534E-01	-1.470286E-01	5.689486E-02	1.707441E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

ONE TENTH, -100 DEG SUBCASE 10
LOAD STEP = 2.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.337973E-03	7.494951E-08	2.123175E-01	4.909183E-06	-2.985408E-03	-5.697601E-07
2	G	3.558577E-03	7.407735E-03	2.508172E-01	-1.127651E-01	-1.490065E-02	5.061528E-03
3	G	4.507627E-03	8.919111E-03	2.494726E-01	-8.837102E-02	1.930935E-02	6.452446E-04
4	G	5.203352E-03	8.297700E-03	2.192494E-01	-6.690559E-02	7.240685E-02	-2.670262E-03
5	G	4.698484E-03	6.302553E-03	1.659484E-01	-4.786848E-02	6.754102E-02	-2.255370E-03
6	G	2.898776E-03	3.436888E-03	9.237087E-02	-5.911401E-02	1.689950E-01	-6.620207E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.074961E-03	6.611493E-03	2.384136E-01	-8.887411E-02	-2.745105E-02	6.191441E-03
9	G	3.934066E-03	7.983810E-03	2.301606E-01	-6.875311E-02	2.614201E-02	3.643246E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

TWO TENTHS, -100 DEG SUBCASE 20
LOAD STEP = 3.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.691157E-03	1.905202E-07	2.680572E-01	1.847643E-05	1.527627E-02	-1.248713E-06
2	G	5.635408E-03	1.173461E-02	3.162127E-01	-1.451740E-01	-1.771712E-02	7.838580E-03
3	G	7.160627E-03	1.410619E-02	3.142774E-01	-1.109430E-01	2.355055E-02	1.114703E-03
4	G	8.261741E-03	1.312533E-02	2.761639E-01	-8.499318E-02	9.245283E-02	-4.341727E-03
5	G	7.435414E-03	9.947084E-03	2.087409E-01	-5.601097E-02	8.432796E-02	-3.576442E-03
6	G	4.644937E-03	5.448967E-03	1.166323E-01	-7.662639E-02	2.121746E-01	-1.057166E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.881834E-03	1.045123E-02	3.004286E-01	-1.116431E-01	-3.519308E-02	9.880900E-03
9	G	6.245694E-03	1.263463E-02	2.900405E-01	-8.612657E-02	3.354646E-02	5.398593E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

THREE TENTHS, -100 DEG SUBCASE 30
LOAD STEP = 4.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.818393E-03	3.303268E-07	3.071887E-01	3.789037E-05	3.358318E-02	-1.794215E-06
2	G	7.358482E-03	1.539462E-02	3.622115E-01	-1.694845E-01	-2.013173E-02	1.017058E-02
3	G	9.389227E-03	1.849651E-02	3.599668E-01	-1.287184E-01	2.665234E-02	1.499262E-03
4	G	1.084166E-02	1.720156E-02	3.162685E-01	-9.862070E-02	1.066026E-01	-5.797445E-03
5	G	9.745697E-03	1.302121E-02	2.388895E-01	-6.220870E-02	9.618243E-02	-4.687210E-03
6	G	6.126054E-03	7.148823E-03	1.337277E-01	-8.945189E-02	2.424180E-01	-1.395661E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.392026E-03	1.367477E-02	3.438969E-01	-1.284474E-01	-4.045379E-02	1.296521E-02
9	G	8.177868E-03	1.653513E-02	3.319375E-01	-9.884719E-02	3.850844E-02	6.991255E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

FOUR TENTHS, -100 DEG SUBCASE 40
LOAD STEP = 5.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.815549E-03	4.882976E-07	3.383566E-01	6.176219E-05	5.106654E-02	-2.099691E-06
2	G	8.887932E-03	1.865747E-02	3.987474E-01	-1.887014E-01	-2.210472E-02	1.226054E-02
3	G	1.137274E-02	2.241346E-02	3.962588E-01	-1.428327E-01	2.913562E-02	1.845148E-03
4	G	1.314090E-02	2.083980E-02	3.481293E-01	-1.093907E-01	1.177987E-01	-7.100588E-03
5	G	1.180575E-02	1.576597E-02	2.628518E-01	-6.713477E-02	1.056267E-01	-5.681665E-03
6	G	7.450973E-03	8.669370E-03	1.473214E-01	-9.974714E-02	2.663150E-01	-1.699767E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.733103E-03	1.654639E-02	3.784393E-01	-1.417183E-01	-4.457231E-02	1.571552E-02
9	G	9.896498E-03	2.001343E-02	3.652318E-01	-1.088776E-01	4.239183E-02	8.498236E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

FIVE TENTHS, -100 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.724511E-03	6.612528E-07	3.646933E-01	8.933952E-05	6.764618E-02	-2.105637E-06
2	G	1.028700E-02	2.165163E-02	4.295394E-01	-2.047803E-01	-2.377161E-02	1.418610E-02
3	G	1.319068E-02	2.601072E-02	4.268444E-01	-1.546800E-01	3.122950E-02	2.166471E-03
4	G	1.525081E-02	2.418317E-02	3.749863E-01	-1.184143E-01	1.272016E-01	-8.298245E-03
5	G	1.369757E-02	1.828950E-02	2.830600E-01	-7.130133E-02	1.136077E-01	-6.597931E-03
6	G	8.670487E-03	1.006933E-02	1.587893E-01	-1.085007E-01	2.863633E-01	-1.980759E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.959666E-03	1.918127E-02	4.075684E-01	-1.528413E-01	-4.798283E-02	1.823821E-02
9	G	1.147129E-02	2.320808E-02	3.933094E-01	-1.172708E-01	4.562372E-02	9.958071E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

SIX TENTHS, -100 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.567908E-03	8.472538E-07	3.877298E-01	1.201250E-04	8.337066E-02	-1.772012E-06
2	G	1.158950E-02	2.444687E-02	4.564089E-01	-2.187168E-01	-2.520978E-02	1.598779E-02
3	G	1.488603E-02	2.937162E-02	4.535326E-01	-1.649788E-01	3.305077E-02	2.470545E-03
4	G	1.722077E-02	2.730885E-02	3.984258E-01	-1.262469E-01	1.353822E-01	-9.417096E-03
5	G	1.546536E-02	2.064998E-02	3.007046E-01	-7.495505E-02	1.205873E-01	-7.456366E-03
6	G	9.812166E-03	1.138036E-02	1.688054E-01	-1.162030E-01	3.037859E-01	-2.244765E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.010122E-02	2.164133E-02	4.330005E-01	-1.625046E-01	-5.089664E-02	2.058996E-02
9	G	1.293969E-02	2.619340E-02	4.178238E-01	-1.245479E-01	4.840908E-02	1.139202E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

SEVEN TENTHS, -100 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.359713E-03	1.044926E-06	4.083432E-01	1.537585E-04	9.831440E-02	-1.070209E-06
2	G	1.281629E-02	2.708620E-02	4.803988E-01	-2.310800E-01	-2.646712E-02	1.769048E-02
3	G	1.648528E-02	3.254744E-02	4.773592E-01	-1.741381E-01	3.466722E-02	2.761953E-03
4	G	1.908116E-02	3.026432E-02	4.193563E-01	-1.332062E-01	1.426674E-01	-1.047382E-02
5	G	1.713625E-02	2.288314E-02	3.164670E-01	-7.823407E-02	1.268301E-01	-8.269516E-03
6	G	1.089298E-02	1.262193E-02	1.777555E-01	-1.231348E-01	3.192823E-01	-2.495554E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.117600E-02	2.396467E-02	4.557187E-01	-1.710986E-01	-5.343791E-02	2.280604E-02
9	G	1.432475E-02	2.901509E-02	4.397222E-01	-1.310061E-01	5.086607E-02	1.281156E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

EIGHT TENTHS, -100 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.109332E-03	1.253231E-06	4.270884E-01	1.899668E-04	1.125522E-01	2.112483E-08
2	G	1.398139E-02	2.959852E-02	5.021684E-01	-2.422301E-01	-2.757640E-02	1.931092E-02
3	G	1.800622E-02	3.557264E-02	4.989793E-01	-1.824172E-01	3.612259E-02	3.043732E-03
4	G	2.085239E-02	3.308145E-02	4.383523E-01	-1.394931E-01	1.492638E-01	-1.147975E-02
5	G	1.872842E-02	2.501293E-02	3.307782E-01	-8.122472E-02	1.325037E-01	-9.045799E-03
6	G	1.192433E-02	1.380710E-02	1.858838E-01	-1.294734E-01	3.332949E-01	-2.735650E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.219625E-02	2.617685E-02	4.763445E-01	-1.788693E-01	-5.568686E-02	2.491031E-02
9	G	1.564196E-02	3.170382E-02	4.596036E-01	-1.368334E-01	5.306972E-02	1.422349E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 265

NINE TENTHS, -100 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.823477E-03	1.471353E-06	4.443410E-01	2.285347E-04	1.261525E-01	1.518459E-06
2	G	1.509476E-02	3.200445E-02	5.221648E-01	-2.524115E-01	-2.856151E-02	2.086115E-02
3	G	1.946155E-02	3.847177E-02	5.188370E-01	-1.899918E-01	3.744717E-02	3.317993E-03
4	G	2.254898E-02	3.578291E-02	4.558030E-01	-1.452438E-01	1.553112E-01	-1.244304E-02
5	G	2.025479E-02	2.705638E-02	3.439300E-01	-8.398504E-02	1.377216E-01	-9.791214E-03
6	G	1.291432E-02	1.494517E-02	1.933557E-01	-1.353390E-01	3.461232E-01	-2.966852E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.317072E-02	2.829606E-02	4.952992E-01	-1.859828E-01	-5.769885E-02	2.691992E-02
9	G	1.690236E-02	3.428142E-02	4.778739E-01	-1.421570E-01	5.507099E-02	1.563205E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 266

ONE, -100 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.050716E-02	1.698633E-06	4.603690E-01	2.692883E-04	1.391755E-01	3.434821E-06
2	G	1.616384E-02	3.431936E-02	5.407061E-01	-2.617986E-01	-2.944057E-02	2.235022E-02
3	G	2.086071E-02	4.126310E-02	5.372483E-01	-1.969875E-01	3.866293E-02	3.586259E-03
4	G	2.418175E-02	3.838560E-02	4.719857E-01	-1.505552E-01	1.609090E-01	-1.336978E-02
5	G	2.172497E-02	2.902616E-02	3.561304E-01	-8.655624E-02	1.425650E-01	-1.051022E-02
6	G	1.386900E-02	1.604306E-02	2.002888E-01	-1.408173E-01	3.579803E-01	-3.190494E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.410594E-02	3.033584E-02	5.128826E-01	-1.925571E-01	-5.951411E-02	2.884776E-02
9	G	1.811415E-02	3.676413E-02	4.948224E-01	-1.470674E-01	5.690632E-02	1.703992E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -150 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.329357E-03	7.437726E-08	2.117432E-01	4.830657E-06	-3.062573E-03	-5.652146E-07
2	G	3.554602E-03	7.382452E-03	2.499540E-01	-1.108043E-01	-1.442291E-02	5.059672E-03
3	G	4.477409E-03	8.890040E-03	2.485298E-01	-8.601610E-02	1.895038E-02	6.768920E-04
4	G	5.159586E-03	8.284648E-03	2.184707E-01	-6.563790E-02	7.223493E-02	-2.638176E-03
5	G	4.658239E-03	6.303390E-03	1.654289E-01	-4.711042E-02	6.696173E-02	-2.240450E-03
6	G	2.877196E-03	3.447597E-03	9.215534E-02	-5.912841E-02	1.686269E-01	-6.614641E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.060283E-03	6.606536E-03	2.377721E-01	-8.760615E-02	-2.769051E-02	6.220341E-03
9	G	3.913347E-03	7.986764E-03	2.296523E-01	-6.793053E-02	2.631566E-02	3.592006E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -150 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.686817E-03	1.903182E-07	2.676367E-01	1.849735E-05	1.532557E-02	-1.245954E-06
2	G	5.624424E-03	1.174474E-02	3.158057E-01	-1.452613E-01	-1.760436E-02	7.829248E-03
3	G	7.141180E-03	1.411988E-02	3.139054E-01	-1.109813E-01	2.332847E-02	1.134883E-03
4	G	8.238425E-03	1.314163E-02	2.758557E-01	-8.505850E-02	9.251013E-02	-4.352503E-03
5	G	7.415195E-03	9.966651E-03	2.085413E-01	-5.600548E-02	8.395544E-02	-3.560192E-03
6	G	4.635133E-03	5.467578E-03	1.165695E-01	-7.704809E-02	2.121285E-01	-1.060899E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.870153E-03	1.045910E-02	3.000183E-01	-1.116668E-01	-3.529124E-02	9.897561E-03
9	G	6.226935E-03	1.264375E-02	2.896551E-01	-8.617808E-02	3.356984E-02	5.363917E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -150 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.814030E-03	3.251841E-07	3.068205E-01	3.753560E-05	3.363425E-02	-1.796317E-06
2	G	7.347537E-03	1.540439E-02	3.618525E-01	-1.695409E-01	-2.002201E-02	1.015977E-02
3	G	9.369682E-03	1.850986E-02	3.596382E-01	-1.287229E-01	2.644521E-02	1.521028E-03
4	G	1.081836E-02	1.721783E-02	3.159991E-01	-9.868506E-02	1.066554E-01	-5.808874E-03
5	G	9.725576E-03	1.304074E-02	2.387155E-01	-6.219887E-02	9.585211E-02	-4.670788E-03
6	G	6.116510E-03	7.167524E-03	1.336745E-01	-8.983377E-02	2.423800E-01	-1.399505E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.380294E-03	1.368252E-02	3.435376E-01	-1.284556E-01	-4.054826E-02	1.298240E-02
9	G	8.159135E-03	1.654421E-02	3.316016E-01	-9.889132E-02	3.853524E-02	6.951347E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -150 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.811173E-03	4.886369E-07	3.380218E-01	6.184368E-05	5.111982E-02	-2.092935E-06
2	G	8.876565E-03	1.866814E-02	3.984268E-01	-1.888199E-01	-2.201346E-02	1.224863E-02
3	G	1.135335E-02	2.242764E-02	3.959672E-01	-1.429043E-01	2.895646E-02	1.865994E-03
4	G	1.311776E-02	2.085618E-02	3.478866E-01	-1.094648E-01	1.178543E-01	-7.113407E-03
5	G	1.178558E-02	1.578537E-02	2.626931E-01	-6.711914E-02	1.053268E-01	-5.665388E-03
6	G	7.441477E-03	8.688073E-03	1.472733E-01	-1.000967E-01	2.662792E-01	-1.703605E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.721408E-03	1.655408E-02	3.781117E-01	-1.417571E-01	-4.464569E-02	1.573151E-02
9	G	9.877605E-03	2.002212E-02	3.649224E-01	-1.089289E-01	4.240833E-02	8.463067E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -150 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.720106E-03	6.616519E-07	3.643821E-01	8.943871E-05	6.769919E-02	-2.096743E-06
2	G	1.027555E-02	2.166231E-02	4.292416E-01	-2.048970E-01	-2.368563E-02	1.417355E-02
3	G	1.317127E-02	2.602490E-02	4.265735E-01	-1.547509E-01	3.106178E-02	2.187601E-03
4	G	1.522766E-02	2.419949E-02	3.747607E-01	-1.184869E-01	1.272552E-01	-8.311487E-03
5	G	1.367735E-02	1.830881E-02	2.829121E-01	-7.128321E-02	1.133282E-01	-6.581658E-03
6	G	8.661034E-03	1.008803E-02	1.587447E-01	-1.088282E-01	2.863295E-01	-1.984614E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.947946E-03	1.918888E-02	4.072635E-01	-1.528792E-01	-4.805029E-02	1.825406E-02
9	G	1.145235E-02	2.321666E-02	3.930213E-01	-1.173195E-01	4.563889E-02	9.922792E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -150 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.563472E-03	8.477174E-07	3.874366E-01	1.202402E-04	8.342290E-02	-1.760800E-06
2	G	1.157799E-02	2.445752E-02	4.561283E-01	-2.188301E-01	-2.512785E-02	1.597478E-02
3	G	1.486659E-02	2.938574E-02	4.532773E-01	-1.650473E-01	3.289188E-02	2.491906E-03
4	G	1.719759E-02	2.732510E-02	3.982132E-01	-1.263174E-01	1.354339E-01	-9.430614E-03
5	G	1.544509E-02	2.066919E-02	3.005648E-01	-7.493524E-02	1.203236E-01	-7.440100E-03
6	G	9.802728E-03	1.139905E-02	1.687634E-01	-1.165131E-01	3.037534E-01	-2.248629E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.008948E-02	2.164886E-02	4.327130E-01	-1.625410E-01	-5.095967E-02	2.060572E-02
9	G	1.292071E-02	2.620186E-02	4.175520E-01	-1.245941E-01	4.842327E-02	1.135673E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -150 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.355249E-03	1.045449E-06	4.080644E-01	1.538888E-04	9.836563E-02	-1.056563E-06
2	G	1.280473E-02	2.709679E-02	4.801317E-01	-2.311895E-01	-2.638847E-02	1.767712E-02
3	G	1.646580E-02	3.256149E-02	4.771162E-01	-1.742041E-01	3.451546E-02	2.783500E-03
4	G	1.905794E-02	3.028050E-02	4.191539E-01	-1.332746E-01	1.427173E-01	-1.048753E-02
5	G	1.711592E-02	2.290226E-02	3.163337E-01	-7.821310E-02	1.265792E-01	-8.253254E-03
6	G	1.088355E-02	1.264060E-02	1.777156E-01	-1.234307E-01	3.192509E-01	-2.499422E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.116422E-02	2.397212E-02	4.554450E-01	-1.711334E-01	-5.349740E-02	2.282171E-02
9	G	1.430574E-02	2.902346E-02	4.394634E-01	-1.310501E-01	5.087947E-02	1.277633E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -150 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.104838E-03	1.253812E-06	4.268213E-01	1.901112E-04	1.126024E-01	3.730487E-08
2	G	1.396978E-02	2.960906E-02	5.019125E-01	-2.423361E-01	-2.750053E-02	1.929727E-02
3	G	1.798671E-02	3.558661E-02	4.987465E-01	-1.824807E-01	3.597681E-02	3.065430E-03
4	G	2.082913E-02	3.309755E-02	4.381584E-01	-1.395595E-01	1.493121E-01	-1.149361E-02
5	G	1.870802E-02	2.503196E-02	3.306501E-01	-8.120295E-02	1.322634E-01	-9.029538E-03
6	G	1.191489E-02	1.382576E-02	1.858455E-01	-1.297574E-01	3.332642E-01	-2.739521E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.218444E-02	2.618423E-02	4.760823E-01	-1.789027E-01	-5.574339E-02	2.492590E-02
9	G	1.562292E-02	3.171211E-02	4.593556E-01	-1.368754E-01	5.308243E-02	1.418841E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -150 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.818955E-03	1.471989E-06	4.440840E-01	2.286926E-04	1.262015E-01	1.537260E-06
2	G	1.508311E-02	3.201493E-02	5.219182E-01	-2.525143E-01	-2.848804E-02	2.084726E-02
3	G	1.944200E-02	3.848566E-02	5.186126E-01	-1.900531E-01	3.730650E-02	3.339815E-03
4	G	2.252568E-02	3.579894E-02	4.556162E-01	-1.453084E-01	1.553580E-01	-1.245701E-02
5	G	2.023434E-02	2.707533E-02	3.438064E-01	-8.396272E-02	1.374903E-01	-9.774952E-03
6	G	1.290488E-02	1.496381E-02	1.933187E-01	-1.356129E-01	3.460931E-01	-2.970723E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.315889E-02	2.830337E-02	4.950466E-01	-1.860148E-01	-5.775286E-02	2.693542E-02
9	G	1.688329E-02	3.428964E-02	4.776351E-01	-1.421972E-01	5.508309E-02	1.559716E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -150 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.050261E-02	1.699322E-06	4.601206E-01	2.694591E-04	1.392234E-01	3.456320E-06
2	G	1.615215E-02	3.432978E-02	5.404676E-01	-2.618983E-01	-2.936919E-02	2.233615E-02
3	G	2.084113E-02	4.127693E-02	5.370312E-01	-1.970467E-01	3.852671E-02	3.608186E-03
4	G	2.415842E-02	3.840156E-02	4.718050E-01	-1.506180E-01	1.609545E-01	-1.338383E-02
5	G	2.170447E-02	2.904503E-02	3.560107E-01	-8.653355E-02	1.423415E-01	-1.049396E-02
6	G	1.385955E-02	1.606168E-02	2.002529E-01	-1.410823E-01	3.579507E-01	-3.194365E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.409408E-02	3.034309E-02	5.126384E-01	-1.925879E-01	-5.956592E-02	2.886317E-02
9	G	1.809505E-02	3.677227E-02	4.945914E-01	-1.471060E-01	5.691789E-02	1.700527E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -200 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.325145E-03	7.450133E-08	2.112128E-01	4.852360E-06	-3.017707E-03	-5.637214E-07
2	G	3.543497E-03	7.393614E-03	2.494490E-01	-1.109679E-01	-1.430976E-02	5.052850E-03
3	G	4.458285E-03	8.904914E-03	2.480719E-01	-8.614436E-02	1.869600E-02	6.945065E-04
4	G	5.136708E-03	8.301627E-03	2.180888E-01	-6.572475E-02	7.229453E-02	-2.648136E-03
5	G	4.638614E-03	6.323676E-03	1.651854E-01	-4.714686E-02	6.650320E-02	-2.224147E-03
6	G	2.867461E-03	3.466329E-03	9.207732E-02	-5.965106E-02	1.685755E-01	-6.652638E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.048743E-03	6.614806E-03	2.372560E-01	-8.767575E-02	-2.779697E-02	6.235649E-03
9	G	3.894632E-03	7.996119E-03	2.291646E-01	-6.800894E-02	2.632786E-02	3.567292E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256
TWO TENTHS, -200 DEG SUBCASE 20
LOAD STEP = 3.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.682544E-03	1.905734E-07	2.672155E-01	1.854526E-05	1.537727E-02	-1.242979E-06
2	G	5.613167E-03	1.175579E-02	3.154044E-01	-1.454095E-01	-1.750137E-02	7.819555E-03
3	G	7.121970E-03	1.413456E-02	3.135413E-01	-1.110846E-01	2.311382E-02	1.154171E-03
4	G	8.215481E-03	1.315839E-02	2.755522E-01	-8.514321E-02	9.257090E-02	-4.364204E-03
5	G	7.395362E-03	9.986543E-03	2.083453E-01	-5.600919E-02	8.358337E-02	-3.543831E-03
6	G	4.625593E-03	5.486342E-03	1.165089E-01	-7.747866E-02	2.120869E-01	-1.064724E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.858560E-03	1.046712E-02	2.996074E-01	-1.117226E-01	-3.537972E-02	9.913184E-03
9	G	6.208139E-03	1.265278E-02	2.892666E-01	-8.624350E-02	3.358529E-02	5.333286E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -200 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.809710E-03	3.259699E-07	3.064521E-01	3.763924E-05	3.368774E-02	-1.790909E-06
2	G	7.336203E-03	1.541532E-02	3.615010E-01	-1.696751E-01	-1.992615E-02	1.014869E-02
3	G	9.350399E-03	1.852436E-02	3.593191E-01	-1.288104E-01	2.625190E-02	1.541222E-03
4	G	1.079535E-02	1.723446E-02	3.157334E-01	-9.876554E-02	1.067136E-01	-5.821362E-03
5	G	9.705601E-03	1.306040E-02	2.385427E-01	-6.219085E-02	9.552394E-02	-4.654460E-03
6	G	6.107036E-03	7.186289E-03	1.336219E-01	-9.021625E-02	2.423425E-01	-1.403355E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.368657E-03	1.369038E-02	3.431777E-01	-1.285028E-01	-4.062732E-02	1.299818E-02
9	G	8.140288E-03	1.655307E-02	3.312614E-01	-9.894916E-02	3.855113E-02	6.918191E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -200 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.806813E-03	4.889875E-07	3.376867E-01	6.192640E-05	5.117357E-02	-2.086160E-06
2	G	8.865143E-03	1.867904E-02	3.981071E-01	-1.889490E-01	-2.192397E-02	1.223667E-02
3	G	1.133402E-02	2.244207E-02	3.956768E-01	-1.429871E-01	2.877855E-02	1.886650E-03
4	G	1.309470E-02	2.087269E-02	3.476447E-01	-1.095423E-01	1.179103E-01	-7.126434E-03
5	G	1.176550E-02	1.580487E-02	2.625349E-01	-6.710525E-02	1.050271E-01	-5.649099E-03
6	G	7.432031E-03	8.706826E-03	1.472255E-01	-1.004475E-01	2.662439E-01	-1.707466E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.709738E-03	1.656182E-02	3.777839E-01	-1.418013E-01	-4.471721E-02	1.574725E-02
9	G	9.858708E-03	2.003082E-02	3.646124E-01	-1.089824E-01	4.242320E-02	8.429107E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -200 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.715709E-03	6.620672E-07	3.640707E-01	8.953828E-05	6.775243E-02	-2.087806E-06
2	G	1.026407E-02	2.167313E-02	4.289442E-01	-2.050193E-01	-2.360067E-02	1.416099E-02
3	G	1.315189E-02	2.603922E-02	4.263033E-01	-1.548277E-01	3.089481E-02	2.208617E-03
4	G	1.520455E-02	2.421590E-02	3.745356E-01	-1.185612E-01	1.273089E-01	-8.324843E-03
5	G	1.365718E-02	1.832817E-02	2.827644E-01	-7.126600E-02	1.130491E-01	-6.565391E-03
6	G	8.651598E-03	1.010677E-02	1.587003E-01	-1.091561E-01	2.862959E-01	-1.988480E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.936241E-03	1.919652E-02	4.069586E-01	-1.529199E-01	-4.811667E-02	1.826977E-02
9	G	1.143342E-02	2.322524E-02	3.927328E-01	-1.173693E-01	4.565309E-02	9.888312E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -200 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.559042E-03	8.481928E-07	3.871433E-01	1.203556E-04	8.347527E-02	-1.749561E-06
2	G	1.156646E-02	2.446826E-02	4.558479E-01	-2.189467E-01	-2.504660E-02	1.596178E-02
3	G	1.484717E-02	2.939996E-02	4.530224E-01	-1.651195E-01	3.273351E-02	2.513185E-03
4	G	1.717443E-02	2.734142E-02	3.980008E-01	-1.263889E-01	1.354855E-01	-9.444203E-03
5	G	1.542484E-02	2.068844E-02	3.004251E-01	-7.491597E-02	1.200603E-01	-7.423847E-03
6	G	9.793295E-03	1.141777E-02	1.687214E-01	-1.168232E-01	3.037210E-01	-2.252498E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.007774E-02	2.165641E-02	4.324254E-01	-1.625791E-01	-5.102198E-02	2.062138E-02
9	G	1.290174E-02	2.621035E-02	4.172800E-01	-1.246409E-01	4.843680E-02	1.132203E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -200 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.350787E-03	1.045982E-06	4.077854E-01	1.540190E-04	9.841696E-02	-1.042901E-06
2	G	1.279316E-02	2.710746E-02	4.798647E-01	-2.313013E-01	-2.631034E-02	1.766377E-02
3	G	1.644634E-02	3.257562E-02	4.768734E-01	-1.742725E-01	3.436412E-02	2.804983E-03
4	G	1.903475E-02	3.029673E-02	4.189517E-01	-1.333436E-01	1.427671E-01	-1.050129E-02
5	G	1.709560E-02	2.292140E-02	3.162003E-01	-7.819250E-02	1.263286E-01	-8.237008E-03
6	G	1.087411E-02	1.265930E-02	1.776756E-01	-1.237264E-01	3.192193E-01	-2.503292E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.115245E-02	2.397959E-02	4.551713E-01	-1.711694E-01	-5.355635E-02	2.283731E-02
9	G	1.428673E-02	2.903185E-02	4.392045E-01	-1.310944E-01	5.089237E-02	1.274160E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -200 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.100347E-03	1.254400E-06	4.265543E-01	1.902556E-04	1.126526E-01	5.349411E-08
2	G	1.395816E-02	2.961965E-02	5.016567E-01	-2.424437E-01	-2.742507E-02	1.928365E-02
3	G	1.796721E-02	3.560065E-02	4.985138E-01	-1.825460E-01	3.583137E-02	3.087074E-03
4	G	2.080589E-02	3.311370E-02	4.379645E-01	-1.396264E-01	1.493602E-01	-1.150750E-02
5	G	1.868764E-02	2.505101E-02	3.305221E-01	-8.118144E-02	1.320233E-01	-9.013296E-03
6	G	1.190545E-02	1.384443E-02	1.858071E-01	-1.300412E-01	3.332334E-01	-2.743390E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.217264E-02	2.619163E-02	4.758200E-01	-1.789369E-01	-5.579950E-02	2.494142E-02
9	G	1.560388E-02	3.172042E-02	4.591075E-01	-1.369177E-01	5.309474E-02	1.415376E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -200 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.814437E-03	1.472632E-06	4.438269E-01	2.288505E-04	1.262505E-01	1.556066E-06
2	G	1.507146E-02	3.202546E-02	5.216718E-01	-2.526182E-01	-2.841490E-02	2.083342E-02
3	G	1.942246E-02	3.849962E-02	5.183883E-01	-1.901156E-01	3.716613E-02	3.361591E-03
4	G	2.250241E-02	3.581501E-02	4.554294E-01	-1.453732E-01	1.554047E-01	-1.247099E-02
5	G	2.021390E-02	2.709430E-02	3.436828E-01	-8.394060E-02	1.372593E-01	-9.758710E-03
6	G	1.289542E-02	1.498246E-02	1.932816E-01	-1.358864E-01	3.460628E-01	-2.974590E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.314706E-02	2.831070E-02	4.947939E-01	-1.860475E-01	-5.780651E-02	2.695087E-02
9	G	1.686422E-02	3.429786E-02	4.773961E-01	-1.422376E-01	5.509487E-02	1.556266E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -200 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.049806E-02	1.700017E-06	4.598722E-01	2.696298E-04	1.392713E-01	3.477820E-06
2	G	1.614046E-02	3.434024E-02	5.402293E-01	-2.619988E-01	-2.929811E-02	2.232211E-02
3	G	2.082155E-02	4.129080E-02	5.368142E-01	-1.971070E-01	3.839075E-02	3.630070E-03
4	G	2.413510E-02	3.841754E-02	4.716242E-01	-1.506810E-01	1.609999E-01	-1.339789E-02
5	G	2.168398E-02	2.906392E-02	3.558909E-01	-8.651098E-02	1.421183E-01	-1.047772E-02
6	G	1.385009E-02	1.608031E-02	2.002170E-01	-1.413469E-01	3.579210E-01	-3.198231E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.408223E-02	3.035035E-02	5.123940E-01	-1.926192E-01	-5.961743E-02	2.887855E-02
9	G	1.807595E-02	3.678042E-02	4.943602E-01	-1.471448E-01	5.692917E-02	1.697097E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -250 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.320932E-03	7.463038E-08	2.106818E-01	4.874085E-06	-2.970313E-03	-5.619806E-07
2	G	3.532331E-03	7.405038E-03	2.489449E-01	-1.111462E-01	-1.420031E-02	5.045667E-03
3	G	4.439197E-03	8.920093E-03	2.476158E-01	-8.629019E-02	1.844441E-02	7.121947E-04
4	G	5.113875E-03	8.318784E-03	2.177075E-01	-6.581748E-02	7.235470E-02	-2.658388E-03
5	G	4.618987E-03	6.344083E-03	1.649420E-01	-4.718475E-02	6.604616E-02	-2.207666E-03
6	G	2.857662E-03	3.485128E-03	9.199908E-02	-6.017214E-02	1.685231E-01	-6.688290E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.037208E-03	6.623178E-03	2.367392E-01	-8.775382E-02	-2.790111E-02	6.250920E-03
9	G	3.875895E-03	8.005532E-03	2.286754E-01	-6.809194E-02	2.633825E-02	3.542903E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -250 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.678284E-03	1.885241E-07	2.667924E-01	1.843549E-05	1.542881E-02	-1.238610E-06
2	G	5.601716E-03	1.176736E-02	3.150064E-01	-1.456029E-01	-1.740650E-02	7.809766E-03
3	G	7.102863E-03	1.414977E-02	3.131819E-01	-1.112372E-01	2.290610E-02	1.172803E-03
4	G	8.192702E-03	1.317539E-02	2.752510E-01	-8.524233E-02	9.263380E-02	-4.376611E-03
5	G	7.375674E-03	1.000658E-02	2.081508E-01	-5.601952E-02	8.321179E-02	-3.527544E-03
6	G	4.616120E-03	5.505166E-03	1.164491E-01	-7.791381E-02	2.120471E-01	-1.068636E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.846986E-03	1.047521E-02	2.991948E-01	-1.118033E-01	-3.546118E-02	9.928572E-03
9	G	6.189289E-03	1.266173E-02	2.888743E-01	-8.632021E-02	3.359534E-02	5.303946E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -250 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.805389E-03	3.316792E-07	3.060798E-01	3.812827E-05	3.374373E-02	-1.779553E-06
2	G	7.324293E-03	1.542751E-02	3.611553E-01	-1.699081E-01	-1.984781E-02	1.013709E-02
3	G	9.331335E-03	1.854010E-02	3.590081E-01	-1.290037E-01	2.607567E-02	1.559522E-03
4	G	1.077260E-02	1.725134E-02	3.154693E-01	-9.886760E-02	1.067775E-01	-5.835169E-03
5	G	9.685749E-03	1.308012E-02	2.383694E-01	-6.218661E-02	9.519698E-02	-4.638191E-03
6	G	6.097623E-03	7.205063E-03	1.335689E-01	-9.060080E-02	2.423039E-01	-1.407233E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.357061E-03	1.369822E-02	3.428131E-01	-1.285995E-01	-4.068710E-02	1.301228E-02
9	G	8.121215E-03	1.656145E-02	3.309118E-01	-9.902477E-02	3.855321E-02	6.892584E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -250 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.802449E-03	4.893259E-07	3.373516E-01	6.200936E-05	5.122748E-02	-2.079423E-06
2	G	8.853743E-03	1.868992E-02	3.977871E-01	-1.890754E-01	-2.183435E-02	1.222478E-02
3	G	1.131468E-02	2.245649E-02	3.953860E-01	-1.430673E-01	2.860061E-02	1.907338E-03
4	G	1.307162E-02	2.088923E-02	3.474025E-01	-1.096191E-01	1.179658E-01	-7.139410E-03
5	G	1.174538E-02	1.582438E-02	2.623765E-01	-6.709108E-02	1.047278E-01	-5.632846E-03
6	G	7.422531E-03	8.725591E-03	1.471774E-01	-1.007972E-01	2.662082E-01	-1.711322E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.698064E-03	1.656959E-02	3.774561E-01	-1.418442E-01	-4.478906E-02	1.576307E-02
9	G	9.839816E-03	2.003958E-02	3.643023E-01	-1.090354E-01	4.243826E-02	8.395010E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -250 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.711310E-03	6.624807E-07	3.637592E-01	8.963820E-05	6.780585E-02	-2.078865E-06
2	G	1.025260E-02	2.168395E-02	4.286467E-01	-2.051404E-01	-2.351577E-02	1.414848E-02
3	G	1.313251E-02	2.605356E-02	4.260328E-01	-1.549034E-01	3.072793E-02	2.229641E-03
4	G	1.518144E-02	2.423234E-02	3.743103E-01	-1.186352E-01	1.273623E-01	-8.338177E-03
5	G	1.363699E-02	1.834755E-02	2.826166E-01	-7.124867E-02	1.127702E-01	-6.549153E-03
6	G	8.642124E-03	1.012552E-02	1.586557E-01	-1.094832E-01	2.862620E-01	-1.992345E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.924535E-03	1.920418E-02	4.066535E-01	-1.529602E-01	-4.818316E-02	1.828553E-02
9	G	1.141448E-02	2.323386E-02	3.924443E-01	-1.174189E-01	4.566730E-02	9.853814E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -250 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.554611E-03	8.486675E-07	3.868498E-01	1.204713E-04	8.352781E-02	-1.738311E-06
2	G	1.155494E-02	2.447901E-02	4.555673E-01	-2.190627E-01	-2.496544E-02	1.594882E-02
3	G	1.482774E-02	2.941421E-02	4.527673E-01	-1.651911E-01	3.257523E-02	2.534469E-03
4	G	1.715128E-02	2.735776E-02	3.977884E-01	-1.264603E-01	1.355369E-01	-9.457780E-03
5	G	1.540457E-02	2.070770E-02	3.002853E-01	-7.489666E-02	1.197972E-01	-7.407617E-03
6	G	9.783830E-03	1.143650E-02	1.686794E-01	-1.171328E-01	3.036883E-01	-2.256366E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.006600E-02	2.166398E-02	4.321377E-01	-1.626170E-01	-5.108432E-02	2.063707E-02
9	G	1.288276E-02	2.621886E-02	4.170079E-01	-1.246876E-01	4.845031E-02	1.128734E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -250 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.346325E-03	1.046515E-06	4.075064E-01	1.541497E-04	9.846845E-02	-1.029221E-06
2	G	1.278159E-02	2.711814E-02	4.795977E-01	-2.314127E-01	-2.623229E-02	1.765046E-02
3	G	1.642687E-02	3.258977E-02	4.766306E-01	-1.743406E-01	3.421286E-02	2.826468E-03
4	G	1.901155E-02	3.031298E-02	4.187495E-01	-1.334126E-01	1.428167E-01	-1.051505E-02
5	G	1.707527E-02	2.294057E-02	3.160670E-01	-7.817189E-02	1.260781E-01	-8.220783E-03
6	G	1.086465E-02	1.267801E-02	1.776355E-01	-1.240217E-01	3.191876E-01	-2.507161E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.114069E-02	2.398709E-02	4.548975E-01	-1.712053E-01	-5.361531E-02	2.285293E-02
9	G	1.426772E-02	2.904027E-02	4.389455E-01	-1.311388E-01	5.090524E-02	1.270689E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -250 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.095855E-03	1.254989E-06	4.262871E-01	1.904004E-04	1.127029E-01	6.970729E-08
2	G	1.394655E-02	2.963027E-02	5.014008E-01	-2.425510E-01	-2.734969E-02	1.927006E-02
3	G	1.794770E-02	3.561472E-02	4.982809E-01	-1.826111E-01	3.568601E-02	3.108719E-03
4	G	2.078265E-02	3.312986E-02	4.377706E-01	-1.396932E-01	1.494083E-01	-1.152138E-02
5	G	1.866725E-02	2.507009E-02	3.303940E-01	-8.115994E-02	1.317835E-01	-8.997073E-03
6	G	1.189598E-02	1.386312E-02	1.857687E-01	-1.303245E-01	3.332025E-01	-2.747259E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.216085E-02	2.619904E-02	4.755576E-01	-1.789710E-01	-5.585559E-02	2.495697E-02
9	G	1.558484E-02	3.172875E-02	4.588593E-01	-1.369599E-01	5.310702E-02	1.411913E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -250 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.809917E-03	1.473275E-06	4.435698E-01	2.290088E-04	1.262997E-01	1.574900E-06
2	G	1.505981E-02	3.203600E-02	5.214252E-01	-2.527219E-01	-2.834184E-02	2.081959E-02
3	G	1.940292E-02	3.851359E-02	5.181640E-01	-1.901781E-01	3.702582E-02	3.383366E-03
4	G	2.247912E-02	3.583109E-02	4.552425E-01	-1.454380E-01	1.554513E-01	-1.248497E-02
5	G	2.019345E-02	2.711329E-02	3.435592E-01	-8.391847E-02	1.370284E-01	-9.742486E-03
6	G	1.288595E-02	1.500113E-02	1.932445E-01	-1.361596E-01	3.460325E-01	-2.978459E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.313524E-02	2.831805E-02	4.945412E-01	-1.860801E-01	-5.786016E-02	2.696634E-02
9	G	1.684515E-02	3.430612E-02	4.771570E-01	-1.422780E-01	5.510661E-02	1.552819E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -250 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.049352E-02	1.700713E-06	4.596237E-01	2.698010E-04	1.393193E-01	3.499352E-06
2	G	1.612878E-02	3.435071E-02	5.399908E-01	-2.620993E-01	-2.922709E-02	2.230809E-02
3	G	2.080198E-02	4.130469E-02	5.365972E-01	-1.971671E-01	3.825486E-02	3.651954E-03
4	G	2.411178E-02	3.843355E-02	4.714434E-01	-1.507441E-01	1.610451E-01	-1.341195E-02
5	G	2.166348E-02	2.908282E-02	3.557711E-01	-8.648844E-02	1.418951E-01	-1.046149E-02
6	G	1.384060E-02	1.609895E-02	2.001811E-01	-1.416113E-01	3.578911E-01	-3.202097E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.407038E-02	3.035763E-02	5.121496E-01	-1.926505E-01	-5.966892E-02	2.889393E-02
9	G	1.805685E-02	3.678860E-02	4.941291E-01	-1.471836E-01	5.694041E-02	1.693669E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -300 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.316669E-03	7.475861E-08	2.101518E-01	4.899284E-06	-2.923653E-03	-5.608063E-07
2	G	3.521375E-03	7.415888E-03	2.484362E-01	-1.112821E-01	-1.408487E-02	5.039105E-03
3	G	4.420004E-03	8.934611E-03	2.471527E-01	-8.638688E-02	1.819098E-02	7.299841E-04
4	G	5.090829E-03	8.335573E-03	2.173218E-01	-6.589039E-02	7.240821E-02	-2.667701E-03
5	G	4.599148E-03	6.364242E-03	1.646957E-01	-4.721436E-02	6.559100E-02	-2.191554E-03
6	G	2.847666E-03	3.503786E-03	9.191887E-02	-6.068237E-02	1.684658E-01	-6.725298E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.025678E-03	6.631402E-03	2.362224E-01	-8.780676E-02	-2.800854E-02	6.266480E-03
9	G	3.857235E-03	8.014949E-03	2.281882E-01	-6.815975E-02	2.635139E-02	3.518716E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -300 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.673996E-03	1.910591E-07	2.663724E-01	1.863860E-05	1.548181E-02	-1.236910E-06
2	G	5.590672E-03	1.177810E-02	3.146017E-01	-1.457074E-01	-1.729724E-02	7.800407E-03
3	G	7.083566E-03	1.416413E-02	3.128130E-01	-1.112938E-01	2.268621E-02	1.192656E-03
4	G	8.169603E-03	1.319213E-02	2.749451E-01	-8.531338E-02	9.269084E-02	-4.387623E-03
5	G	7.355652E-03	1.002649E-02	2.079530E-01	-5.601740E-02	8.284128E-02	-3.511222E-03
6	G	4.606365E-03	5.523964E-03	1.163871E-01	-7.833627E-02	2.120020E-01	-1.072378E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.835389E-03	1.048331E-02	2.987851E-01	-1.118357E-01	-3.555569E-02	9.944486E-03
9	G	6.170563E-03	1.267103E-02	2.884890E-01	-8.637503E-02	3.361492E-02	5.272790E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -300 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.801068E-03	3.252617E-07	3.057149E-01	3.766801E-05	3.379554E-02	-1.783049E-06
2	G	7.313522E-03	1.543739E-02	3.607984E-01	-1.699495E-01	-1.973660E-02	1.012669E-02
3	G	9.311859E-03	1.855360E-02	3.586811E-01	-1.289925E-01	2.586740E-02	1.581433E-03
4	G	1.074935E-02	1.726787E-02	3.152019E-01	-9.892787E-02	1.068294E-01	-5.846417E-03
5	G	9.665619E-03	1.309985E-02	2.381968E-01	-6.217523E-02	9.486917E-02	-4.621909E-03
6	G	6.087971E-03	7.223889E-03	1.335161E-01	-9.097851E-02	2.422662E-01	-1.411057E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.345398E-03	1.370622E-02	3.424575E-01	-1.286006E-01	-4.078369E-02	1.302968E-02
9	G	8.102600E-03	1.657090E-02	3.305802E-01	-9.906612E-02	3.858129E-02	6.852927E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -300 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.798093E-03	4.897053E-07	3.370163E-01	6.209256E-05	5.128177E-02	-2.072546E-06
2	G	8.842313E-03	1.870095E-02	3.974676E-01	-1.892077E-01	-2.174588E-02	1.221289E-02
3	G	1.129538E-02	2.247107E-02	3.950959E-01	-1.431539E-01	2.842355E-02	1.927907E-03
4	G	1.304859E-02	2.090585E-02	3.471608E-01	-1.096977E-01	1.180214E-01	-7.152503E-03
5	G	1.172531E-02	1.584397E-02	2.622184E-01	-6.707784E-02	1.044289E-01	-5.616602E-03
6	G	7.413041E-03	8.744391E-03	1.471295E-01	-1.011473E-01	2.661727E-01	-1.715189E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.686405E-03	1.657741E-02	3.771280E-01	-1.418903E-01	-4.485977E-02	1.577875E-02
9	G	9.820923E-03	2.004834E-02	3.639919E-01	-1.090897E-01	4.245229E-02	8.361682E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -300 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.706915E-03	6.629033E-07	3.634476E-01	8.973843E-05	6.785949E-02	-2.069897E-06
2	G	1.024112E-02	2.169487E-02	4.283493E-01	-2.052643E-01	-2.343149E-02	1.413599E-02
3	G	1.311315E-02	2.606799E-02	4.257627E-01	-1.549822E-01	3.056152E-02	2.250603E-03
4	G	1.515834E-02	2.424884E-02	3.740852E-01	-1.187102E-01	1.274156E-01	-8.351570E-03
5	G	1.361682E-02	1.836698E-02	2.824689E-01	-7.123186E-02	1.124916E-01	-6.532928E-03
6	G	8.632645E-03	1.014429E-02	1.586111E-01	-1.098103E-01	2.862281E-01	-1.996215E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.912839E-03	1.921188E-02	4.063483E-01	-1.530020E-01	-4.824905E-02	1.830122E-02
9	G	1.139555E-02	2.324251E-02	3.921556E-01	-1.174691E-01	4.568096E-02	9.819777E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -300 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.550181E-03	8.491492E-07	3.865563E-01	1.205873E-04	8.358051E-02	-1.727039E-06
2	G	1.154341E-02	2.448983E-02	4.552868E-01	-2.191803E-01	-2.488471E-02	1.593588E-02
3	G	1.480833E-02	2.942852E-02	4.525124E-01	-1.652647E-01	3.241730E-02	2.555707E-03
4	G	1.712813E-02	2.737415E-02	3.975760E-01	-1.265323E-01	1.355882E-01	-9.471395E-03
5	G	1.538432E-02	2.072701E-02	3.001456E-01	-7.487767E-02	1.195343E-01	-7.391405E-03
6	G	9.774355E-03	1.145525E-02	1.686373E-01	-1.174421E-01	3.036556E-01	-2.260237E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.005427E-02	2.167159E-02	4.318500E-01	-1.626558E-01	-5.114626E-02	2.065272E-02
9	G	1.286379E-02	2.622740E-02	4.167356E-01	-1.247348E-01	4.846342E-02	1.125302E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -300 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.341864E-03	1.047054E-06	4.072273E-01	1.542805E-04	9.852006E-02	-1.015523E-06
2	G	1.277001E-02	2.712888E-02	4.793307E-01	-2.315252E-01	-2.615458E-02	1.763718E-02
3	G	1.640742E-02	3.260398E-02	4.763878E-01	-1.744100E-01	3.406188E-02	2.847915E-03
4	G	1.898836E-02	3.032927E-02	4.185472E-01	-1.334820E-01	1.428662E-01	-1.052882E-02
5	G	1.705494E-02	2.295976E-02	3.159336E-01	-7.815149E-02	1.258280E-01	-8.204577E-03
6	G	1.085517E-02	1.269673E-02	1.775954E-01	-1.243166E-01	3.191558E-01	-2.511031E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.112892E-02	2.399461E-02	4.546236E-01	-1.712417E-01	-5.367396E-02	2.286852E-02
9	G	1.424872E-02	2.904871E-02	4.386864E-01	-1.311833E-01	5.091779E-02	1.267248E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -300 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.091364E-03	1.255583E-06	4.260199E-01	1.905454E-04	1.127534E-01	8.593555E-08
2	G	1.393494E-02	2.964092E-02	5.011449E-01	-2.426592E-01	-2.727458E-02	1.925650E-02
3	G	1.792821E-02	3.562883E-02	4.980482E-01	-1.826771E-01	3.554089E-02	3.130333E-03
4	G	2.075942E-02	3.314606E-02	4.375767E-01	-1.397603E-01	1.494561E-01	-1.153528E-02
5	G	1.864686E-02	2.508918E-02	3.302658E-01	-8.113860E-02	1.315438E-01	-8.980869E-03
6	G	1.188650E-02	1.388182E-02	1.857302E-01	-1.306075E-01	3.331713E-01	-2.751128E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.214906E-02	2.620648E-02	4.752952E-01	-1.790056E-01	-5.591145E-02	2.497249E-02
9	G	1.556581E-02	3.173710E-02	4.586110E-01	-1.370023E-01	5.311904E-02	1.408477E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -300 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.805398E-03	1.473923E-06	4.433127E-01	2.291672E-04	1.263490E-01	1.593748E-06
2	G	1.504816E-02	3.204658E-02	5.211788E-01	-2.528262E-01	-2.826901E-02	2.080580E-02
3	G	1.938339E-02	3.852761E-02	5.179397E-01	-1.902413E-01	3.688573E-02	3.405114E-03
4	G	2.245585E-02	3.584721E-02	4.550557E-01	-1.455031E-01	1.554977E-01	-1.249897E-02
5	G	2.017301E-02	2.713229E-02	3.434355E-01	-8.389647E-02	1.367977E-01	-9.726280E-03
6	G	1.287646E-02	1.501980E-02	1.932074E-01	-1.364324E-01	3.460020E-01	-2.982326E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.312342E-02	2.832541E-02	4.942884E-01	-1.861130E-01	-5.791359E-02	2.698179E-02
9	G	1.682608E-02	3.431439E-02	4.769179E-01	-1.423186E-01	5.511813E-02	1.549396E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -300 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.048897E-02	1.701413E-06	4.593752E-01	2.699723E-04	1.393674E-01	3.520899E-06
2	G	1.611709E-02	3.436121E-02	5.397523E-01	-2.622001E-01	-2.915629E-02	2.229410E-02
3	G	2.078241E-02	4.131861E-02	5.363801E-01	-1.972278E-01	3.811916E-02	3.673812E-03
4	G	2.408846E-02	3.844958E-02	4.712626E-01	-1.508072E-01	1.610902E-01	-1.342602E-02
5	G	2.164298E-02	2.910175E-02	3.556513E-01	-8.646598E-02	1.416722E-01	-1.044528E-02
6	G	1.383111E-02	1.611760E-02	2.001451E-01	-1.418753E-01	3.578611E-01	-3.205962E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.405853E-02	3.036493E-02	5.119051E-01	-1.926821E-01	-5.972024E-02	2.890931E-02
9	G	1.803776E-02	3.679679E-02	4.938978E-01	-1.472225E-01	5.695147E-02	1.690265E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -350 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.312457E-03	7.485583E-08	2.096203E-01	4.925781E-06	-2.872987E-03	-5.594613E-07
2	G	3.510286E-03	7.427397E-03	2.479310E-01	-1.114530E-01	-1.397600E-02	5.032715E-03
3	G	4.400928E-03	8.949907E-03	2.466954E-01	-8.652706E-02	1.793946E-02	7.473367E-04
4	G	5.068014E-03	8.352903E-03	2.169402E-01	-6.598334E-02	7.246548E-02	-2.677941E-03
5	G	4.579475E-03	6.384779E-03	1.644517E-01	-4.725303E-02	6.513751E-02	-2.175384E-03
6	G	2.837709E-03	3.522654E-03	9.183972E-02	-6.119790E-02	1.684113E-01	-6.763017E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.014166E-03	6.639925E-03	2.357052E-01	-8.788177E-02	-2.811258E-02	6.281768E-03
9	G	3.838546E-03	8.024569E-03	2.276989E-01	-6.824119E-02	2.636091E-02	3.494884E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -350 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.669722E-03	1.913565E-07	2.659505E-01	1.868937E-05	1.553466E-02	-1.233905E-06
2	G	5.579437E-03	1.178934E-02	3.142000E-01	-1.458566E-01	-1.719600E-02	7.790956E-03
3	G	7.064371E-03	1.417904E-02	3.124486E-01	-1.113991E-01	2.247311E-02	1.211864E-03
4	G	8.146666E-03	1.320910E-02	2.746414E-01	-8.539881E-02	9.274997E-02	-4.399336E-03
5	G	7.335776E-03	1.004654E-02	2.077566E-01	-5.602194E-02	8.247127E-02	-3.494973E-03
6	G	4.596677E-03	5.542822E-03	1.163259E-01	-7.876331E-02	2.119589E-01	-1.076208E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.823809E-03	1.049149E-02	2.983736E-01	-1.118928E-01	-3.564332E-02	9.960175E-03
9	G	6.151784E-03	1.268025E-02	2.880998E-01	-8.644105E-02	3.362919E-02	5.242876E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -350 DEG SUBCASE 30
LOAD STEP = 4.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.796747E-03	3.241819E-07	3.053461E-01	3.762563E-05	3.384986E-02	-1.780094E-06
2	G	7.302183E-03	1.544852E-02	3.604470E-01	-1.700882E-01	-1.964265E-02	1.011578E-02
3	G	9.292597E-03	1.856833E-02	3.583622E-01	-1.290856E-01	2.567590E-02	1.601484E-03
4	G	1.072635E-02	1.728465E-02	3.149361E-01	-9.900946E-02	1.068868E-01	-5.858966E-03
5	G	9.645611E-03	1.311964E-02	2.380237E-01	-6.216765E-02	9.454251E-02	-4.605682E-03
6	G	6.078380E-03	7.242724E-03	1.334631E-01	-9.135833E-02	2.422276E-01	-1.414908E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.333775E-03	1.371421E-02	3.420972E-01	-1.286506E-01	-4.086133E-02	1.304544E-02
9	G	8.083759E-03	1.657988E-02	3.302393E-01	-9.912498E-02	3.859578E-02	6.820686E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -350 DEG SUBCASE 40
LOAD STEP = 5.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.793731E-03	4.900643E-07	3.366809E-01	6.217619E-05	5.133621E-02	-2.065738E-06
2	G	8.830904E-03	1.871196E-02	3.971477E-01	-1.893373E-01	-2.165729E-02	1.220107E-02
3	G	1.127606E-02	2.248565E-02	3.948053E-01	-1.432378E-01	2.824644E-02	1.948511E-03
4	G	1.302554E-02	2.092249E-02	3.469187E-01	-1.097756E-01	1.180766E-01	-7.165544E-03
5	G	1.170520E-02	1.586356E-02	2.620601E-01	-6.706432E-02	1.041303E-01	-5.600395E-03
6	G	7.403498E-03	8.763202E-03	1.470814E-01	-1.014962E-01	2.661367E-01	-1.719052E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.674742E-03	1.658525E-02	3.767999E-01	-1.419351E-01	-4.493082E-02	1.579452E-02
9	G	9.802036E-03	2.005716E-02	3.636815E-01	-1.091435E-01	4.246651E-02	8.328207E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -350 DEG SUBCASE 50
LOAD STEP = 6.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.702518E-03	6.633241E-07	3.631360E-01	8.983901E-05	6.791331E-02	-2.060927E-06
2	G	1.022965E-02	2.170579E-02	4.280517E-01	-2.053870E-01	-2.334726E-02	1.412356E-02
3	G	1.309378E-02	2.608244E-02	4.254923E-01	-1.550600E-01	3.039519E-02	2.271574E-03
4	G	1.513524E-02	2.426536E-02	3.738600E-01	-1.187848E-01	1.274686E-01	-8.364941E-03
5	G	1.359662E-02	1.838643E-02	2.823210E-01	-7.121494E-02	1.122133E-01	-6.516734E-03
6	G	8.623126E-03	1.016308E-02	1.585664E-01	-1.101366E-01	2.861938E-01	-2.000082E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.901141E-03	1.921961E-02	4.060431E-01	-1.530433E-01	-4.831504E-02	1.831696E-02
9	G	1.137662E-02	2.325119E-02	3.918668E-01	-1.175192E-01	4.569464E-02	9.785724E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -350 DEG SUBCASE 60
LOAD STEP = 7.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.545751E-03	8.496301E-07	3.862627E-01	1.207037E-04	8.363338E-02	-1.715757E-06
2	G	1.153189E-02	2.450067E-02	4.550062E-01	-2.192973E-01	-2.480407E-02	1.592299E-02
3	G	1.478892E-02	2.944286E-02	4.522573E-01	-1.653376E-01	3.225946E-02	2.576948E-03
4	G	1.710498E-02	2.739056E-02	3.973635E-01	-1.266041E-01	1.356393E-01	-9.484997E-03
5	G	1.536405E-02	2.074633E-02	3.000057E-01	-7.485864E-02	1.192717E-01	-7.375218E-03
6	G	9.764848E-03	1.147401E-02	1.685952E-01	-1.177508E-01	3.036226E-01	-2.264106E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.004254E-02	2.167922E-02	4.315621E-01	-1.626943E-01	-5.120823E-02	2.066841E-02
9	G	1.284483E-02	2.623597E-02	4.164633E-01	-1.247818E-01	4.847651E-02	1.121870E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -350 DEG SUBCASE 70
LOAD STEP = 8.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.337401E-03	1.047593E-06	4.069482E-01	1.544118E-04	9.857182E-02	-1.001807E-06
2	G	1.275845E-02	2.713963E-02	4.790637E-01	-2.316373E-01	-2.607696E-02	1.762393E-02
3	G	1.638796E-02	3.261821E-02	4.761450E-01	-1.744791E-01	3.391099E-02	2.869364E-03
4	G	1.896516E-02	3.034558E-02	4.183449E-01	-1.335513E-01	1.429155E-01	-1.054259E-02
5	G	1.703461E-02	2.297897E-02	3.158001E-01	-7.813107E-02	1.255780E-01	-8.188393E-03
6	G	1.084567E-02	1.271547E-02	1.775553E-01	-1.246111E-01	3.191238E-01	-2.514901E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.111716E-02	2.400215E-02	4.543496E-01	-1.712781E-01	-5.373261E-02	2.288414E-02
9	G	1.422972E-02	2.905718E-02	4.384272E-01	-1.312279E-01	5.093031E-02	1.263810E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -350 DEG SUBCASE 80
LOAD STEP = 9.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.086872E-03	1.256178E-06	4.257527E-01	1.906908E-04	1.128040E-01	1.021879E-07
2	G	1.392333E-02	2.965159E-02	5.008889E-01	-2.427670E-01	-2.719956E-02	1.924296E-02
3	G	1.790871E-02	3.564296E-02	4.978154E-01	-1.827429E-01	3.539584E-02	3.151947E-03
4	G	2.073618E-02	3.316228E-02	4.373828E-01	-1.398273E-01	1.495039E-01	-1.154918E-02
5	G	1.862647E-02	2.510830E-02	3.301377E-01	-8.111725E-02	1.313043E-01	-8.964685E-03
6	G	1.187700E-02	1.390053E-02	1.856917E-01	-1.308901E-01	3.331401E-01	-2.754997E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.213726E-02	2.621394E-02	4.750327E-01	-1.790401E-01	-5.596730E-02	2.498803E-02
9	G	1.554677E-02	3.174549E-02	4.583627E-01	-1.370447E-01	5.313103E-02	1.405044E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -350 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.800877E-03	1.474571E-06	4.430555E-01	2.293261E-04	1.263984E-01	1.612626E-06
2	G	1.503651E-02	3.205717E-02	5.209322E-01	-2.529303E-01	-2.819626E-02	2.079203E-02
3	G	1.936385E-02	3.854164E-02	5.177153E-01	-1.903044E-01	3.674570E-02	3.426862E-03
4	G	2.243257E-02	3.586334E-02	4.548688E-01	-1.455681E-01	1.555440E-01	-1.251296E-02
5	G	2.015255E-02	2.715132E-02	3.433118E-01	-8.387449E-02	1.365672E-01	-9.710093E-03
6	G	1.286696E-02	1.503849E-02	1.931702E-01	-1.367049E-01	3.459714E-01	-2.986194E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.311159E-02	2.833280E-02	4.940356E-01	-1.861460E-01	-5.796701E-02	2.699725E-02
9	G	1.680702E-02	3.432268E-02	4.766788E-01	-1.423591E-01	5.512961E-02	1.545975E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -350 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.048443E-02	1.702114E-06	4.591266E-01	2.701441E-04	1.394157E-01	3.542479E-06
2	G	1.610541E-02	3.437173E-02	5.395138E-01	-2.623009E-01	-2.908555E-02	2.228014E-02
3	G	2.076284E-02	4.133256E-02	5.361630E-01	-1.972885E-01	3.798351E-02	3.695670E-03
4	G	2.406515E-02	3.846563E-02	4.710818E-01	-1.508704E-01	1.611353E-01	-1.344009E-02
5	G	2.162247E-02	2.912069E-02	3.555314E-01	-8.644354E-02	1.414494E-01	-1.042909E-02
6	G	1.382159E-02	1.613627E-02	2.001090E-01	-1.421390E-01	3.578310E-01	-3.209827E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.404668E-02	3.037225E-02	5.116606E-01	-1.927136E-01	-5.977153E-02	2.892469E-02
9	G	1.801866E-02	3.680501E-02	4.936665E-01	-1.472614E-01	5.696248E-02	1.686863E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -400 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.308255E-03	7.494755E-08	2.090882E-01	4.952560E-06	-2.820690E-03	-5.579416E-07
2	G	3.499173E-03	7.439137E-03	2.474265E-01	-1.116330E-01	-1.386989E-02	5.026489E-03
3	G	4.381892E-03	8.965499E-03	2.462397E-01	-8.668194E-02	1.768865E-02	7.645553E-04
4	G	5.045276E-03	8.370449E-03	2.165598E-01	-6.608344E-02	7.252375E-02	-2.688557E-03
5	G	4.559818E-03	6.405460E-03	1.642081E-01	-4.729382E-02	6.468567E-02	-2.159282E-03
6	G	2.827697E-03	3.541601E-03	9.176043E-02	-6.171228E-02	1.683564E-01	-6.800756E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.002666E-03	6.648575E-03	2.351877E-01	-8.796283E-02	-2.821519E-02	6.297006E-03
9	G	3.819854E-03	8.034292E-03	2.272086E-01	-6.832678E-02	2.636920E-02	3.471074E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -400 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.665449E-03	1.915687E-07	2.655284E-01	1.873404E-05	1.558788E-02	-1.230821E-06
2	G	5.568208E-03	1.180066E-02	3.137983E-01	-1.460064E-01	-1.709542E-02	7.781586E-03
3	G	7.045182E-03	1.419402E-02	3.120842E-01	-1.115054E-01	2.226060E-02	1.231041E-03
4	G	8.123734E-03	1.322614E-02	2.743376E-01	-8.548456E-02	9.280857E-02	-4.411058E-03
5	G	7.315885E-03	1.006665E-02	2.075602E-01	-5.602675E-02	8.210197E-02	-3.478763E-03
6	G	4.586940E-03	5.561711E-03	1.162645E-01	-7.918912E-02	2.119152E-01	-1.080039E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.812235E-03	1.049972E-02	2.979619E-01	-1.119504E-01	-3.573059E-02	9.975884E-03
9	G	6.133011E-03	1.268953E-02	2.877105E-01	-8.650734E-02	3.364302E-02	5.213219E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -400 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.792425E-03	3.214724E-07	3.049771E-01	3.745417E-05	3.390450E-02	-1.779322E-06
2	G	7.290816E-03	1.545979E-02	3.600962E-01	-1.702339E-01	-1.955030E-02	1.010491E-02
3	G	9.273359E-03	1.858319E-02	3.580440E-01	-1.291861E-01	2.548607E-02	1.621375E-03
4	G	1.070338E-02	1.730151E-02	3.146705E-01	-9.909234E-02	1.069444E-01	-5.871600E-03
5	G	9.625591E-03	1.313946E-02	2.378505E-01	-6.216011E-02	9.421655E-02	-4.589502E-03
6	G	6.068749E-03	7.261581E-03	1.334099E-01	-9.173707E-02	2.421885E-01	-1.418757E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.322161E-03	1.372223E-02	3.417366E-01	-1.287041E-01	-4.093736E-02	1.306110E-02
9	G	8.064911E-03	1.658888E-02	3.298979E-01	-9.918506E-02	3.860906E-02	6.789217E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -400 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.789370E-03	4.904277E-07	3.363454E-01	6.226011E-05	5.139089E-02	-2.058912E-06
2	G	8.819500E-03	1.872302E-02	3.968277E-01	-1.894671E-01	-2.156900E-02	1.218930E-02
3	G	1.125674E-02	2.250027E-02	3.945147E-01	-1.433220E-01	2.806960E-02	1.969098E-03
4	G	1.300249E-02	2.093918E-02	3.466766E-01	-1.098535E-01	1.181314E-01	-7.178590E-03
5	G	1.168508E-02	1.588319E-02	2.619017E-01	-6.705094E-02	1.038320E-01	-5.584215E-03
6	G	7.393923E-03	8.782032E-03	1.470332E-01	-1.018444E-01	2.661004E-01	-1.722915E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.663083E-03	1.659312E-02	3.764717E-01	-1.419801E-01	-4.500171E-02	1.581031E-02
9	G	9.783152E-03	2.006602E-02	3.633710E-01	-1.091974E-01	4.248053E-02	8.294894E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -400 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.698120E-03	6.637467E-07	3.628242E-01	8.993992E-05	6.796733E-02	-2.051945E-06
2	G	1.021819E-02	2.171674E-02	4.277541E-01	-2.055098E-01	-2.326327E-02	1.411116E-02
3	G	1.307441E-02	2.609693E-02	4.252218E-01	-1.551380E-01	3.022908E-02	2.292530E-03
4	G	1.511214E-02	2.428192E-02	3.736347E-01	-1.188595E-01	1.275214E-01	-8.378317E-03
5	G	1.357642E-02	1.840590E-02	2.821731E-01	-7.119813E-02	1.119353E-01	-6.500564E-03
6	G	8.613579E-03	1.018188E-02	1.585216E-01	-1.104623E-01	2.861593E-01	-2.003950E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.889445E-03	1.922737E-02	4.057377E-01	-1.530848E-01	-4.838090E-02	1.833270E-02
9	G	1.135769E-02	2.325991E-02	3.915779E-01	-1.175693E-01	4.570814E-02	9.751815E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -400 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.541319E-03	8.501127E-07	3.859691E-01	1.208205E-04	8.368642E-02	-1.704459E-06
2	G	1.152037E-02	2.451153E-02	4.547256E-01	-2.194144E-01	-2.472362E-02	1.591013E-02
3	G	1.476950E-02	2.945723E-02	4.520022E-01	-1.654108E-01	3.210180E-02	2.598176E-03
4	G	1.708183E-02	2.740701E-02	3.971510E-01	-1.266759E-01	1.356901E-01	-9.498605E-03
5	G	1.534377E-02	2.076568E-02	2.998658E-01	-7.483970E-02	1.190093E-01	-7.359053E-03
6	G	9.755315E-03	1.149278E-02	1.685529E-01	-1.180591E-01	3.035894E-01	-2.267976E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.003081E-02	2.168687E-02	4.312742E-01	-1.627330E-01	-5.127009E-02	2.068410E-02
9	G	1.282586E-02	2.624457E-02	4.161909E-01	-1.248289E-01	4.848946E-02	1.118452E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -400 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.332939E-03	1.048133E-06	4.066690E-01	1.545435E-04	9.862373E-02	-9.880730E-07
2	G	1.274688E-02	2.715041E-02	4.787965E-01	-2.317495E-01	-2.599951E-02	1.761071E-02
3	G	1.636851E-02	3.263247E-02	4.759021E-01	-1.745484E-01	3.376025E-02	2.890802E-03
4	G	1.894197E-02	3.036193E-02	4.181426E-01	-1.336206E-01	1.429647E-01	-1.055637E-02
5	G	1.701426E-02	2.299821E-02	3.156666E-01	-7.811073E-02	1.253282E-01	-8.172230E-03
6	G	1.083614E-02	1.273421E-02	1.775150E-01	-1.249052E-01	3.190916E-01	-2.518772E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.110540E-02	2.400971E-02	4.540756E-01	-1.713146E-01	-5.379117E-02	2.289976E-02
9	G	1.421072E-02	2.906568E-02	4.381680E-01	-1.312725E-01	5.094271E-02	1.260383E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -400 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.082381E-03	1.256774E-06	4.254853E-01	1.908366E-04	1.128547E-01	1.184614E-07
2	G	1.391173E-02	2.966229E-02	5.006329E-01	-2.428750E-01	-2.712469E-02	1.922946E-02
3	G	1.788922E-02	3.565712E-02	4.975825E-01	-1.828089E-01	3.525093E-02	3.173550E-03
4	G	2.071294E-02	3.317853E-02	4.371888E-01	-1.398944E-01	1.495515E-01	-1.156308E-02
5	G	1.860606E-02	2.512743E-02	3.300095E-01	-8.109596E-02	1.310650E-01	-8.948520E-03
6	G	1.186747E-02	1.391925E-02	1.856530E-01	-1.311724E-01	3.331087E-01	-2.758867E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.212547E-02	2.622142E-02	4.747701E-01	-1.790747E-01	-5.602306E-02	2.500358E-02
9	G	1.552774E-02	3.175389E-02	4.581144E-01	-1.370872E-01	5.314290E-02	1.401621E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -400 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.796358E-03	1.475222E-06	4.427982E-01	2.294853E-04	1.264479E-01	1.631528E-06
2	G	1.502486E-02	3.206779E-02	5.206856E-01	-2.530344E-01	-2.812365E-02	2.077829E-02
3	G	1.934432E-02	3.855571E-02	5.174910E-01	-1.903676E-01	3.660579E-02	3.448600E-03
4	G	2.240929E-02	3.587950E-02	4.546819E-01	-1.456332E-01	1.555902E-01	-1.252696E-02
5	G	2.013209E-02	2.717036E-02	3.431880E-01	-8.385254E-02	1.363368E-01	-9.693924E-03
6	G	1.285743E-02	1.505718E-02	1.931329E-01	-1.369771E-01	3.459406E-01	-2.990061E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.309977E-02	2.834020E-02	4.937827E-01	-1.861790E-01	-5.802036E-02	2.701272E-02
9	G	1.678795E-02	3.433100E-02	4.764395E-01	-1.423997E-01	5.514100E-02	1.542565E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -400 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.047988E-02	1.702817E-06	4.588780E-01	2.703163E-04	1.394640E-01	3.564086E-06
2	G	1.609373E-02	3.438227E-02	5.392752E-01	-2.624017E-01	-2.901493E-02	2.226620E-02
3	G	2.074327E-02	4.134653E-02	5.359460E-01	-1.973493E-01	3.784797E-02	3.717520E-03
4	G	2.404183E-02	3.848171E-02	4.709010E-01	-1.509336E-01	1.611802E-01	-1.345416E-02
5	G	2.160195E-02	2.913965E-02	3.554115E-01	-8.642115E-02	1.412267E-01	-1.041291E-02
6	G	1.381206E-02	1.615494E-02	2.000729E-01	-1.424024E-01	3.578008E-01	-3.213693E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.403483E-02	3.037958E-02	5.114161E-01	-1.927453E-01	-5.982276E-02	2.894008E-02
9	G	1.799957E-02	3.681325E-02	4.934352E-01	-1.473004E-01	5.697341E-02	1.683470E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -450 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.304088E-03	7.515781E-08	2.085542E-01	4.974300E-06	-2.776541E-03	-5.568507E-07
2	G	3.488095E-03	7.451091E-03	2.469207E-01	-1.118084E-01	-1.376341E-02	5.019781E-03
3	G	4.362812E-03	8.981237E-03	2.457813E-01	-8.681615E-02	1.744131E-02	7.825728E-04
4	G	5.022375E-03	8.388198E-03	2.161767E-01	-6.616744E-02	7.257900E-02	-2.698074E-03
5	G	4.540121E-03	6.426458E-03	1.639645E-01	-4.733540E-02	6.422859E-02	-2.142978E-03
6	G	2.817672E-03	3.560777E-03	9.168179E-02	-6.223441E-02	1.683041E-01	-6.839190E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	2.991151E-03	6.657483E-03	2.346693E-01	-8.804253E-02	-2.832149E-02	6.312940E-03
9	G	3.801164E-03	8.044388E-03	2.267190E-01	-6.841060E-02	2.637788E-02	3.448799E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -450 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.661242E-03	1.918983E-07	2.651055E-01	1.879017E-05	1.564352E-02	-1.227963E-06
2	G	5.556697E-03	1.181292E-02	3.134026E-01	-1.462186E-01	-1.700501E-02	7.771819E-03
3	G	7.026229E-03	1.421000E-02	3.117279E-01	-1.116785E-01	2.205599E-02	1.249330E-03
4	G	8.101170E-03	1.324366E-02	2.740387E-01	-8.558998E-02	9.287065E-02	-4.423741E-03
5	G	7.296368E-03	1.008708E-02	2.073672E-01	-5.604057E-02	8.173344E-02	-3.462453E-03
6	G	4.577451E-03	5.580750E-03	1.162053E-01	-7.962316E-02	2.118756E-01	-1.083957E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.800749E-03	1.050809E-02	2.975496E-01	-1.120409E-01	-3.580775E-02	9.990525E-03
9	G	6.114198E-03	1.269871E-02	2.873178E-01	-8.658780E-02	3.364861E-02	5.187748E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -450 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.788151E-03	3.324142E-07	3.046080E-01	3.834717E-05	3.396193E-02	-1.760349E-06
2	G	7.279094E-03	1.547213E-02	3.597524E-01	-1.704506E-01	-1.947058E-02	1.009372E-02
3	G	9.254361E-03	1.859914E-02	3.577344E-01	-1.293625E-01	2.530883E-02	1.639888E-03
4	G	1.068067E-02	1.731869E-02	3.144083E-01	-9.919026E-02	1.070067E-01	-5.885233E-03
5	G	9.605717E-03	1.315943E-02	2.376786E-01	-6.215456E-02	9.389264E-02	-4.573410E-03
6	G	6.059187E-03	7.280503E-03	1.333572E-01	-9.211653E-02	2.421498E-01	-1.422616E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.310639E-03	1.373037E-02	3.413756E-01	-1.287934E-01	-4.099940E-02	1.307545E-02
9	G	8.045966E-03	1.659768E-02	3.295526E-01	-9.925777E-02	3.861241E-02	6.763845E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -450 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.785025E-03	4.907810E-07	3.360096E-01	6.234580E-05	5.144604E-02	-2.052146E-06
2	G	8.808040E-03	1.873430E-02	3.965086E-01	-1.896074E-01	-2.148250E-02	1.217748E-02
3	G	1.123748E-02	2.251513E-02	3.942254E-01	-1.434174E-01	2.789405E-02	1.989497E-03
4	G	1.297953E-02	2.095599E-02	3.464352E-01	-1.099349E-01	1.181866E-01	-7.191845E-03
5	G	1.166504E-02	1.590292E-02	2.617438E-01	-6.703928E-02	1.035341E-01	-5.568025E-03
6	G	7.384393E-03	8.800912E-03	1.469853E-01	-1.021938E-01	2.660647E-01	-1.726799E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.651448E-03	1.660105E-02	3.761432E-01	-1.420305E-01	-4.507072E-02	1.582584E-02
9	G	9.764264E-03	2.007488E-02	3.630598E-01	-1.092535E-01	4.249289E-02	8.262810E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -450 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.693732E-03	6.641853E-07	3.625123E-01	9.004123E-05	6.802158E-02	-2.042921E-06
2	G	1.020669E-02	2.172784E-02	4.274569E-01	-2.056382E-01	-2.318031E-02	1.409876E-02
3	G	1.305508E-02	2.611157E-02	4.249520E-01	-1.552219E-01	3.006373E-02	2.313373E-03
4	G	1.508909E-02	2.429856E-02	3.734098E-01	-1.189360E-01	1.275742E-01	-8.391808E-03
5	G	1.355626E-02	1.842544E-02	2.820254E-01	-7.118223E-02	1.116576E-01	-6.484400E-03
6	G	8.604050E-03	1.020072E-02	1.584769E-01	-1.107884E-01	2.861250E-01	-2.007828E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.877765E-03	1.923516E-02	4.054322E-01	-1.531291E-01	-4.844568E-02	1.834830E-02
9	G	1.133877E-02	2.326864E-02	3.912886E-01	-1.176206E-01	4.572067E-02	9.718709E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -450 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.536894E-03	8.506073E-07	3.856753E-01	1.209374E-04	8.373959E-02	-1.693135E-06
2	G	1.150884E-02	2.452249E-02	4.544452E-01	-2.195349E-01	-2.464387E-02	1.589728E-02
3	G	1.475011E-02	2.947171E-02	4.517474E-01	-1.654876E-01	3.194468E-02	2.619324E-03
4	G	1.705872E-02	2.742351E-02	3.969387E-01	-1.267488E-01	1.357410E-01	-9.512282E-03
5	G	1.532352E-02	2.078507E-02	2.997260E-01	-7.482130E-02	1.187472E-01	-7.342902E-03
6	G	9.745788E-03	1.151158E-02	1.685107E-01	-1.183673E-01	3.035562E-01	-2.271851E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.001909E-02	2.169455E-02	4.309862E-01	-1.627735E-01	-5.133123E-02	2.069969E-02
9	G	1.280690E-02	2.625319E-02	4.159183E-01	-1.248767E-01	4.850174E-02	1.115094E-03

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SEVEN TENTHS, -450 DEG
LOAD STEP = 8.00000E+00
SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.328480E-03	1.048683E-06	4.063897E-01	1.546751E-04	9.867573E-02	-9.743221E-07
2	G	1.273531E-02	2.716126E-02	4.785295E-01	-2.318640E-01	-2.592258E-02	1.759752E-02
3	G	1.634907E-02	3.264682E-02	4.756594E-01	-1.746201E-01	3.360994E-02	2.912176E-03
4	G	1.891880E-02	3.037832E-02	4.179404E-01	-1.336906E-01	1.430137E-01	-1.057019E-02
5	G	1.699393E-02	2.301748E-02	3.155332E-01	-7.809075E-02	1.250787E-01	-8.156084E-03
6	G	1.082661E-02	1.275298E-02	1.774748E-01	-1.251991E-01	3.190593E-01	-2.522643E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.109365E-02	2.401730E-02	4.538015E-01	-1.713522E-01	-5.384918E-02	2.291531E-02
9	G	1.419172E-02	2.907419E-02	4.379086E-01	-1.313175E-01	5.095461E-02	1.257007E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -450 DEG
LOAD STEP = 9.00000E+00
SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.077892E-03	1.257378E-06	4.252180E-01	1.909823E-04	1.129055E-01	1.347442E-07
2	G	1.390011E-02	2.967304E-02	5.003771E-01	-2.429844E-01	-2.705023E-02	1.921598E-02
3	G	1.786974E-02	3.567134E-02	4.973498E-01	-1.828767E-01	3.510636E-02	3.195100E-03
4	G	2.068972E-02	3.319482E-02	4.369949E-01	-1.399620E-01	1.495990E-01	-1.157701E-02
5	G	1.858567E-02	2.514660E-02	3.298813E-01	-8.107492E-02	1.308260E-01	-8.932373E-03
6	G	1.185794E-02	1.393799E-02	1.856144E-01	-1.314543E-01	3.330772E-01	-2.762735E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.211369E-02	2.622893E-02	4.745075E-01	-1.791101E-01	-5.607839E-02	2.501908E-02
9	G	1.550871E-02	3.176231E-02	4.578658E-01	-1.371299E-01	5.315438E-02	1.398242E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -450 DEG
LOAD STEP = 1.00000E+01
SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.791840E-03	1.475879E-06	4.425409E-01	2.296445E-04	1.264975E-01	1.650433E-06
2	G	1.501322E-02	3.207845E-02	5.204390E-01	-2.531397E-01	-2.805137E-02	2.076458E-02
3	G	1.932480E-02	3.856982E-02	5.172666E-01	-1.904321E-01	3.646619E-02	3.470291E-03
4	G	2.238603E-02	3.589570E-02	4.544950E-01	-1.456985E-01	1.556363E-01	-1.254098E-02
5	G	2.011164E-02	2.718943E-02	3.430643E-01	-8.383079E-02	1.361067E-01	-9.677775E-03
6	G	1.284789E-02	1.507589E-02	1.930956E-01	-1.372488E-01	3.459097E-01	-2.993926E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.308796E-02	2.834763E-02	4.935298E-01	-1.862126E-01	-5.807335E-02	2.702815E-02
9	G	1.676889E-02	3.433933E-02	4.762002E-01	-1.424405E-01	5.515205E-02	1.539193E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -450 DEG
LOAD STEP = 1.10000E+01
SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.047533E-02	1.703526E-06	4.586293E-01	2.704884E-04	1.395124E-01	3.585693E-06
2	G	1.608205E-02	3.439285E-02	5.390367E-01	-2.625033E-01	-2.894461E-02	2.225229E-02
3	G	2.072371E-02	4.136055E-02	5.357289E-01	-1.974111E-01	3.771271E-02	3.739326E-03
4	G	2.401852E-02	3.849781E-02	4.707201E-01	-1.509971E-01	1.612249E-01	-1.346824E-02
5	G	2.158145E-02	2.915863E-02	3.552915E-01	-8.639888E-02	1.410043E-01	-1.039676E-02
6	G	1.380252E-02	1.617362E-02	2.000367E-01	-1.426653E-01	3.577704E-01	-3.217554E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.402299E-02	3.038693E-02	5.111715E-01	-1.927774E-01	-5.987368E-02	2.895543E-02
9	G	1.798048E-02	3.682150E-02	4.932038E-01	-1.473394E-01	5.698405E-02	1.680113E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -500 DEG
LOAD STEP = 2.00000E+00
SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.299862E-03	7.515276E-08	2.080212E-01	4.978161E-06	-2.726826E-03	-5.510882E-07
2	G	3.477071E-03	7.462800E-03	2.464132E-01	-1.119725E-01	-1.365458E-02	5.014147E-03
3	G	4.343722E-03	8.996816E-03	2.453219E-01	-8.695167E-02	1.718899E-02	7.991262E-04
4	G	4.999582E-03	8.405868E-03	2.157945E-01	-6.626406E-02	7.263131E-02	-2.709181E-03
5	G	4.520403E-03	6.447258E-03	1.637199E-01	-4.737791E-02	6.378037E-02	-2.126602E-03
6	G	2.807487E-03	3.579784E-03	9.160139E-02	-6.274306E-02	1.682469E-01	-6.876492E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	2.979649E-03	6.666231E-03	2.341504E-01	-8.811483E-02	-2.842436E-02	6.328108E-03
9	G	3.782498E-03	8.054296E-03	2.262283E-01	-6.849127E-02	2.638571E-02	3.423569E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -500 DEG
LOAD STEP = 3.00000E+00
SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.656902E-03	1.916278E-07	2.646835E-01	1.880115E-05	1.569548E-02	-1.224665E-06
2	G	5.545766E-03	1.182350E-02	3.129946E-01	-1.463089E-01	-1.689638E-02	7.763091E-03
3	G	7.006826E-03	1.422423E-02	3.113553E-01	-1.117221E-01	2.183751E-02	1.269281E-03
4	G	8.077881E-03	1.326044E-02	2.737299E-01	-8.565726E-02	9.292430E-02	-4.434540E-03
5	G	7.276057E-03	1.010703E-02	2.071668E-01	-5.603714E-02	8.136562E-02	-3.446469E-03
6	G	4.567314E-03	5.599580E-03	1.161411E-01	-8.003695E-02	2.118262E-01	-1.087704E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.789103E-03	1.051635E-02	2.971380E-01	-1.120679E-01	-3.590390E-02	1.000734E-02
9	G	6.095479E-03	1.270827E-02	2.869310E-01	-8.664090E-02	3.366925E-02	5.154744E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -500 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.783797E-03	3.338586E-07	3.042389E-01	3.851227E-05	3.401581E-02	-1.754121E-06
2	G	7.268087E-03	1.548252E-02	3.593948E-01	-1.705291E-01	-1.936719E-02	1.008331E-02
3	G	9.234907E-03	1.861315E-02	3.574077E-01	-1.293914E-01	2.510821E-02	1.661027E-03
4	G	1.065744E-02	1.733538E-02	3.141391E-01	-9.925894E-02	1.070584E-01	-5.896907E-03
5	G	9.585520E-03	1.317923E-02	2.375039E-01	-6.214558E-02	9.356624E-02	-4.557253E-03
6	G	6.049371E-03	7.299366E-03	1.333030E-01	-9.249187E-02	2.421091E-01	-1.426457E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.298953E-03	1.373843E-02	3.410153E-01	-1.288137E-01	-4.108819E-02	1.309239E-02
9	G	8.027227E-03	1.660702E-02	3.292146E-01	-9.930599E-02	3.863440E-02	6.727108E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -500 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.780647E-03	4.911277E-07	3.356740E-01	6.242961E-05	5.150095E-02	-2.045358E-06
2	G	8.796705E-03	1.874525E-02	3.961876E-01	-1.897270E-01	-2.139332E-02	1.216592E-02
3	G	1.121811E-02	2.252965E-02	3.939334E-01	-1.434914E-01	2.771673E-02	2.010220E-03
4	G	1.295639E-02	2.097267E-02	3.461922E-01	-1.100098E-01	1.182403E-01	-7.204693E-03
5	G	1.164481E-02	1.592255E-02	2.615846E-01	-6.702455E-02	1.032366E-01	-5.551941E-03
6	G	7.374675E-03	8.819750E-03	1.469364E-01	-1.025388E-01	2.660270E-01	-1.730641E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.639773E-03	1.660898E-02	3.758149E-01	-1.420708E-01	-4.514302E-02	1.584191E-02
9	G	9.745395E-03	2.008384E-02	3.627496E-01	-1.093054E-01	4.250794E-02	8.228751E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -500 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.689325E-03	6.645969E-07	3.622004E-01	9.014281E-05	6.807594E-02	-2.033949E-06
2	G	1.019527E-02	2.173876E-02	4.271586E-01	-2.057560E-01	-2.309602E-02	1.408651E-02
3	G	1.303568E-02	2.612603E-02	4.246809E-01	-1.552949E-01	2.989751E-02	2.334396E-03
4	G	1.506594E-02	2.431514E-02	3.731840E-01	-1.190093E-01	1.276263E-01	-8.405081E-03
5	G	1.353598E-02	1.844494E-02	2.818770E-01	-7.116479E-02	1.113801E-01	-6.468301E-03
6	G	8.594401E-03	1.021954E-02	1.584317E-01	-1.111122E-01	2.860897E-01	-2.011686E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.866061E-03	1.924297E-02	4.051268E-01	-1.531682E-01	-4.851222E-02	1.836422E-02
9	G	1.131985E-02	2.327744E-02	3.909999E-01	-1.176698E-01	4.573462E-02	9.684429E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -500 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.532456E-03	8.510837E-07	3.853815E-01	1.210550E-04	8.379299E-02	-1.681820E-06
2	G	1.149734E-02	2.453335E-02	4.541641E-01	-2.196490E-01	-2.456334E-02	1.588453E-02
3	G	1.473069E-02	2.948608E-02	4.514919E-01	-1.655578E-01	3.178703E-02	2.640592E-03
4	G	1.703554E-02	2.743999E-02	3.967259E-01	-1.268199E-01	1.357913E-01	-9.525833E-03
5	G	1.530319E-02	2.080444E-02	2.995858E-01	-7.480203E-02	1.184852E-01	-7.326793E-03
6	G	9.736177E-03	1.153038E-02	1.684682E-01	-1.186742E-01	3.035225E-01	-2.275716E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.000736E-02	2.170225E-02	4.306982E-01	-1.628109E-01	-5.139347E-02	2.071550E-02
9	G	1.278794E-02	2.626186E-02	4.156459E-01	-1.249233E-01	4.851491E-02	1.111654E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -500 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.324013E-03	1.049219E-06	4.061103E-01	1.548078E-04	9.872798E-02	-9.605506E-07
2	G	1.272377E-02	2.717204E-02	4.782622E-01	-2.319743E-01	-2.584512E-02	1.758438E-02
3	G	1.632960E-02	3.266110E-02	4.754162E-01	-1.746875E-01	3.345924E-02	2.933641E-03
4	G	1.889558E-02	3.039470E-02	4.177378E-01	-1.337595E-01	1.430625E-01	-1.058394E-02
5	G	1.697355E-02	2.303674E-02	3.153995E-01	-7.807024E-02	1.248292E-01	-8.139967E-03
6	G	1.081702E-02	1.277175E-02	1.774344E-01	-1.254922E-01	3.190267E-01	-2.526512E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.108189E-02	2.402490E-02	4.535274E-01	-1.713879E-01	-5.390799E-02	2.293103E-02
9	G	1.417273E-02	2.908275E-02	4.376493E-01	-1.313618E-01	5.096712E-02	1.253565E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -500 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.073395E-03	1.257971E-06	4.249506E-01	1.911292E-04	1.129565E-01	1.510723E-07
2	G	1.388852E-02	2.968375E-02	5.001209E-01	-2.430911E-01	-2.697539E-02	1.920254E-02
3	G	1.785023E-02	3.568552E-02	4.971167E-01	-1.829415E-01	3.496150E-02	3.216725E-03
4	G	2.066647E-02	3.321111E-02	4.368008E-01	-1.400288E-01	1.496463E-01	-1.159090E-02
5	G	1.856523E-02	2.516576E-02	3.297529E-01	-8.105355E-02	1.305869E-01	-8.916249E-03
6	G	1.184836E-02	1.395673E-02	1.855757E-01	-1.317359E-01	3.330455E-01	-2.766605E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.210190E-02	2.623645E-02	4.742449E-01	-1.791443E-01	-5.613431E-02	2.503470E-02
9	G	1.548968E-02	3.177077E-02	4.576174E-01	-1.371722E-01	5.316631E-02	1.394809E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -500 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.787316E-03	1.476527E-06	4.422835E-01	2.298049E-04	1.265473E-01	1.669404E-06
2	G	1.500158E-02	3.208909E-02	5.201922E-01	-2.532430E-01	-2.797880E-02	2.075089E-02
3	G	1.930526E-02	3.858392E-02	5.170421E-01	-1.904945E-01	3.632632E-02	3.492048E-03
4	G	2.236274E-02	3.591189E-02	4.543079E-01	-1.457635E-01	1.556823E-01	-1.255497E-02
5	G	2.009115E-02	2.720850E-02	3.429404E-01	-8.380880E-02	1.358765E-01	-9.661641E-03
6	G	1.283831E-02	1.509461E-02	1.930583E-01	-1.375205E-01	3.458787E-01	-2.997796E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.307614E-02	2.835507E-02	4.932768E-01	-1.862454E-01	-5.812681E-02	2.704368E-02
9	G	1.674983E-02	3.434770E-02	4.759610E-01	-1.424810E-01	5.516347E-02	1.535775E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -500 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.047078E-02	1.704229E-06	4.583807E-01	2.706617E-04	1.395610E-01	3.607381E-06
2	G	1.607038E-02	3.440342E-02	5.387980E-01	-2.626035E-01	-2.887404E-02	2.223839E-02
3	G	2.070414E-02	4.137455E-02	5.355116E-01	-1.974713E-01	3.757720E-02	3.761193E-03
4	G	2.399519E-02	3.851392E-02	4.705392E-01	-1.510603E-01	1.612697E-01	-1.348232E-02
5	G	2.156091E-02	2.917762E-02	3.551716E-01	-8.637647E-02	1.407818E-01	-1.038061E-02
6	G	1.379294E-02	1.619231E-02	2.000006E-01	-1.429284E-01	3.577400E-01	-3.221423E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.401114E-02	3.039430E-02	5.109268E-01	-1.928089E-01	-5.992500E-02	2.897088E-02
9	G	1.796139E-02	3.682978E-02	4.929724E-01	-1.473784E-01	5.699499E-02	1.676714E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -550 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.295661E-03	7.537840E-08	2.074880E-01	5.020152E-06	-2.679436E-03	-5.545637E-07
2	G	3.466067E-03	7.474671E-03	2.459067E-01	-1.121414E-01	-1.354922E-02	5.008161E-03
3	G	4.324663E-03	9.012480E-03	2.448625E-01	-8.708533E-02	1.694321E-02	8.167097E-04
4	G	4.976693E-03	8.423569E-03	2.154108E-01	-6.634987E-02	7.268287E-02	-2.718549E-03
5	G	4.500583E-03	6.468148E-03	1.634745E-01	-4.741664E-02	6.333075E-02	-2.110782E-03
6	G	2.797216E-03	3.598866E-03	9.152062E-02	-6.325019E-02	1.681881E-01	-6.915083E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	2.968170E-03	6.675127E-03	2.336319E-01	-8.819053E-02	-2.852671E-02	6.343790E-03
9	G	3.763860E-03	8.064387E-03	2.257381E-01	-6.857148E-02	2.639212E-02	3.402916E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -550 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.652629E-03	1.922329E-07	2.642608E-01	1.887295E-05	1.574992E-02	-1.221769E-06
2	G	5.534565E-03	1.183500E-02	3.125924E-01	-1.464588E-01	-1.679735E-02	7.753968E-03
3	G	6.987651E-03	1.423942E-02	3.109905E-01	-1.118290E-01	2.162649E-02	1.288380E-03
4	G	8.054951E-03	1.327768E-02	2.734257E-01	-8.574314E-02	9.298106E-02	-4.446246E-03
5	G	7.256120E-03	1.012729E-02	2.069699E-01	-5.604271E-02	8.099839E-02	-3.430375E-03
6	G	4.557427E-03	5.618561E-03	1.160791E-01	-8.045912E-02	2.117809E-01	-1.091540E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.777544E-03	1.052474E-02	2.967257E-01	-1.121263E-01	-3.599044E-02	1.002311E-02
9	G	6.076724E-03	1.271774E-02	2.865410E-01	-8.670744E-02	3.368194E-02	5.125852E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -550 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.779464E-03	3.237590E-07	3.038694E-01	3.776144E-05	3.407036E-02	-1.763257E-06
2	G	7.256863E-03	1.549358E-02	3.590412E-01	-1.706499E-01	-1.927164E-02	1.007274E-02
3	G	9.215605E-03	1.862786E-02	3.570863E-01	-1.294669E-01	2.491444E-02	1.681377E-03
4	G	1.063440E-02	1.735232E-02	3.138724E-01	-9.933815E-02	1.071130E-01	-5.909255E-03
5	G	9.565464E-03	1.319918E-02	2.373305E-01	-6.213906E-02	9.324086E-02	-4.541111E-03
6	G	6.039631E-03	7.318296E-03	1.332494E-01	-9.286890E-02	2.420693E-01	-1.430320E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.287323E-03	1.374655E-02	3.406545E-01	-1.288555E-01	-4.116887E-02	1.310853E-02
9	G	8.008433E-03	1.661626E-02	3.288741E-01	-9.936245E-02	3.865039E-02	6.694036E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -550 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.776286E-03	4.915153E-07	3.353381E-01	6.251411E-05	5.155633E-02	-2.038441E-06
2	G	8.785312E-03	1.875643E-02	3.958674E-01	-1.898576E-01	-2.130599E-02	1.215431E-02
3	G	1.119881E-02	2.254442E-02	3.936427E-01	-1.435770E-01	2.754075E-02	2.030746E-03
4	G	1.293335E-02	2.098948E-02	3.459499E-01	-1.100882E-01	1.182943E-01	-7.217756E-03
5	G	1.162466E-02	1.594228E-02	2.614259E-01	-6.701155E-02	1.029395E-01	-5.535847E-03
6	G	7.365003E-03	8.838637E-03	1.468878E-01	-1.028850E-01	2.659898E-01	-1.734505E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.628122E-03	1.661695E-02	3.754864E-01	-1.421166E-01	-4.521336E-02	1.585772E-02
9	G	9.726521E-03	2.009282E-02	3.624387E-01	-1.093597E-01	4.252127E-02	8.195970E-04

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1    LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE                     AUGUST   8, 2000  MSC/NASTRAN  2/ 9/99   PAGE   259

     FIVE TENTHS, -550 DEG
     LOAD STEP =   6.00000E+00                                                                                     SUBCASE 50

                                              D I S P L A C E M E N T   V E C T O R

      POINT ID.   TYPE          T1             T2             T3             R1             R2             R3
             1      G      6.684926E-03   6.650252E-07   3.618884E-01   9.024473E-05   6.813055E-02  -2.024933E-06
             2      G      1.018381E-02   2.174982E-02   4.268608E-01  -2.058793E-01  -2.301277E-02   1.407424E-02
             3      G      1.301633E-02   2.614064E-02   4.244103E-01  -1.553737E-01   2.973206E-02   2.355306E-03
             4      G      1.504285E-02   2.433180E-02   3.729585E-01  -1.190843E-01   1.276784E-01  -8.418471E-03
             5      G      1.351575E-02   1.846450E-02   2.817290E-01  -7.114827E-02   1.111030E-01  -6.452207E-03
             6      G      8.584770E-03   1.023839E-02   1.583866E-01  -1.114363E-01   2.860545E-01  -2.015554E-02
             7      G      0.0            0.0            0.0            0.0            0.0            0.0
             8      G      8.854373E-03   1.925081E-02   4.048212E-01  -1.532103E-01  -4.857767E-02   1.838000E-02
             9      G      1.130093E-02   2.328626E-02   3.907107E-01  -1.177201E-01   4.574760E-02   9.650955E-04
1    LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE                     AUGUST   8, 2000  MSC/NASTRAN  2/ 9/99   PAGE   260

     SIX TENTHS, -550 DEG
     LOAD STEP =   7.00000E+00                                                                                     SUBCASE 60

                                              D I S P L A C E M E N T   V E C T O R

      POINT ID.   TYPE          T1             T2             T3             R1             R2             R3
             1      G      7.528024E-03   8.515719E-07   3.850877E-01   1.211727E-04   8.384653E-02  -1.670478E-06
             2      G      1.148584E-02   2.454430E-02   4.538833E-01  -2.197665E-01  -2.448350E-02   1.587179E-02
             3      G      1.471128E-02   2.950056E-02   4.512367E-01  -1.656318E-01   3.162991E-02   2.661780E-03
             4      G      1.701239E-02   2.745653E-02   3.965132E-01  -1.268920E-01   1.358417E-01  -9.539453E-03
             5      G      1.528289E-02   2.082386E-02   2.994458E-01  -7.478333E-02   1.182235E-01  -7.310698E-03
             6      G      9.726569E-03   1.154919E-02   1.684257E-01  -1.189811E-01   3.034887E-01  -2.279586E-02
             7      G      0.0            0.0            0.0            0.0            0.0            0.0
             8      G      9.995637E-03   2.170998E-02   4.304101E-01  -1.628501E-01  -5.145498E-02   2.073121E-02
             9      G      1.276898E-02   2.627054E-02   4.153733E-01  -1.249706E-01   4.852742E-02   1.108274E-03
1    LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE                     AUGUST   8, 2000  MSC/NASTRAN  2/ 9/99   PAGE   261

     SEVEN TENTHS, -550 DEG
     LOAD STEP =   8.00000E+00                                                                                     SUBCASE 70

                                              D I S P L A C E M E N T   V E C T O R

      POINT ID.   TYPE          T1             T2             T3             R1             R2             R3
             1      G      8.319549E-03   1.049765E-06   4.058309E-01   1.549405E-04   9.878033E-02  -9.467619E-07
             2      G      1.271221E-02   2.718290E-02   4.779949E-01  -2.320868E-01  -2.576819E-02   1.757127E-02
             3      G      1.631015E-02   3.267545E-02   4.751732E-01  -1.747574E-01   3.330896E-02   2.955043E-03
             4      G      1.887239E-02   3.041113E-02   4.175354E-01  -1.338291E-01   1.431112E-01  -1.059773E-02
             5      G      1.695319E-02   2.305604E-02   3.152659E-01  -7.805009E-02   1.245800E-01  -8.123867E-03
             6      G      1.080743E-02   1.279054E-02   1.773939E-01  -1.257851E-01   3.189940E-01  -2.530381E-02
             7      G      0.0            0.0            0.0            0.0            0.0            0.0
             8      G      1.107013E-02   2.403253E-02   4.532532E-01  -1.714248E-01  -5.396625E-02   2.294667E-02
             9      G      1.415373E-02   2.909133E-02   4.373899E-01  -1.314065E-01   5.097914E-02   1.250174E-03
1    LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE                     AUGUST   8, 2000  MSC/NASTRAN  2/ 9/99   PAGE   262

     EIGHT TENTHS, -550 DEG
     LOAD STEP =   9.00000E+00                                                                                     SUBCASE 80

                                              D I S P L A C E M E N T   V E C T O R

      POINT ID.   TYPE          T1             T2             T3             R1             R2             R3
             1      G      9.068903E-03   1.258573E-06   4.246831E-01   1.912760E-04   1.130076E-01   1.674099E-07
             2      G      1.387692E-02   2.969452E-02   4.998647E-01  -2.431993E-01  -2.690096E-02   1.918913E-02
             3      G      1.783074E-02   3.569977E-02   4.968838E-01  -1.830081E-01   3.481698E-02   3.238297E-03
             4      G      2.064324E-02   3.322744E-02   4.366067E-01  -1.400961E-01   1.496935E-01  -1.160482E-02
             5      G      1.854481E-02   2.518495E-02   3.296246E-01  -8.103243E-02   1.303482E-01  -8.900143E-03
             6      G      1.183877E-02   1.397549E-02   1.855369E-01  -1.320171E-01   3.330137E-01  -2.770474E-02
             7      G      0.0            0.0            0.0            0.0            0.0            0.0
             8      G      1.209011E-02   2.624399E-02   4.739822E-01  -1.791792E-01  -5.618981E-02   2.505026E-02
             9      G      1.547065E-02   3.177924E-02   4.573689E-01  -1.372148E-01   5.317785E-02   1.391419E-03
1    LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE                     AUGUST   8, 2000  MSC/NASTRAN  2/ 9/99   PAGE   263

     NINE TENTHS, -550 DEG
     LOAD STEP =   1.00000E+01                                                                                     SUBCASE 90

                                              D I S P L A C E M E N T   V E C T O R

      POINT ID.   TYPE          T1             T2             T3             R1             R2             R3
             1      G      9.782795E-03   1.477183E-06   4.420261E-01   2.299652E-04   1.265972E-01   1.688378E-06
             2      G      1.498995E-02   3.209977E-02   5.199455E-01  -2.533474E-01  -2.790657E-02   2.073723E-02
             3      G      1.928573E-02   3.859806E-02   5.168176E-01  -1.905582E-01   3.618676E-02   3.513757E-03
             4      G      2.233946E-02   3.592813E-02   4.541209E-01  -1.458287E-01   1.557281E-01  -1.256898E-02
             5      G      2.007067E-02   2.722760E-02   3.428166E-01  -8.378701E-02   1.356465E-01  -9.645528E-03
             6      G      1.282873E-02   1.511334E-02   1.930209E-01  -1.377917E-01   3.458476E-01  -3.001663E-02
             7      G      0.0            0.0            0.0            0.0            0.0            0.0
             8      G      1.306433E-02   2.836253E-02   4.930238E-01  -1.862787E-01  -5.817992E-02   2.705917E-02
             9      G      1.673078E-02   3.435608E-02   4.757216E-01  -1.425217E-01   5.517455E-02   1.532395E-03
1    LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE                     AUGUST   8, 2000  MSC/NASTRAN  2/ 9/99   PAGE   264

     ONE, -550 DEG
     LOAD STEP =   1.10000E+01                                                                                     SUBCASE 101

                                              D I S P L A C E M E N T   V E C T O R

      POINT ID.   TYPE          T1             T2             T3             R1             R2             R3
             1      G      1.046624E-02   1.704937E-06   4.581319E-01   2.708349E-04   1.396096E-01   3.629069E-06
             2      G      1.605870E-02   3.441402E-02   5.385594E-01  -2.627046E-01  -2.880377E-02   2.222452E-02
             3      G      2.068458E-02   4.138859E-02   5.352945E-01  -1.975326E-01   3.744198E-02   3.783017E-03
             4      G      2.397188E-02   3.853007E-02   4.703582E-01  -1.511237E-01   1.613143E-01  -1.349640E-02
             5      G      2.154038E-02   2.919662E-02   3.550515E-01  -8.635420E-02   1.405596E-01  -1.036449E-02
             6      G      1.378335E-02   1.621101E-02   1.999643E-01  -1.431909E-01   3.577095E-01  -3.225288E-02
             7      G      0.0            0.0            0.0            0.0            0.0            0.0
             8      G      1.399930E-02   3.040168E-02   5.106822E-01  -1.928408E-01  -5.997601E-02   2.898628E-02
             9      G      1.794230E-02   3.683808E-02   4.927409E-01  -1.474174E-01   5.700565E-02   1.673350E-03
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LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -600 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.291474E-03	7.550521E-08	2.069545E-01	5.050520E-06	-2.628602E-03	-5.546576E-07
2	G	3.455011E-03	7.486895E-03	2.454016E-01	-1.123253E-01	-1.344750E-02	5.002198E-03
3	G	4.305667E-03	9.028614E-03	2.444059E-01	-8.723929E-02	1.669829E-02	8.340076E-04
4	G	4.953946E-03	8.441598E-03	2.150294E-01	-6.644751E-02	7.273548E-02	-2.728714E-03
5	G	4.480851E-03	6.489241E-03	1.632303E-01	-4.746044E-02	6.288357E-02	-2.094904E-03
6	G	2.786925E-03	3.618041E-03	9.144012E-02	-6.375752E-02	1.681302E-01	-6.952989E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	2.956713E-03	6.684167E-03	2.331132E-01	-8.827510E-02	-2.862779E-02	6.359392E-03
9	G	3.745222E-03	8.074575E-03	2.252470E-01	-6.865823E-02	2.639732E-02	3.381439E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -600 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.648356E-03	1.924721E-07	2.638379E-01	1.892123E-05	1.580471E-02	-1.218782E-06
2	G	5.523366E-03	1.184657E-02	3.121902E-01	-1.466102E-01	-1.669918E-02	7.744930E-03
3	G	6.968485E-03	1.425471E-02	3.106257E-01	-1.119381E-01	2.141618E-02	1.307438E-03
4	G	8.032030E-03	1.329500E-02	2.731215E-01	-8.582987E-02	9.303743E-02	-4.457983E-03
5	G	7.236168E-03	1.014762E-02	2.067729E-01	-5.604860E-02	8.063199E-02	-3.414326E-03
6	G	4.547490E-03	5.637572E-03	1.160168E-01	-8.087997E-02	2.117351E-01	-1.095376E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.765990E-03	1.053319E-02	2.963133E-01	-1.121857E-01	-3.607646E-02	1.003890E-02
9	G	6.057975E-03	1.272727E-02	2.861508E-01	-8.677454E-02	3.369413E-02	5.097218E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -600 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.775143E-03	3.243314E-07	3.034998E-01	3.784936E-05	3.412623E-02	-1.758146E-06
2	G	7.245555E-03	1.550495E-02	3.586893E-01	-1.707896E-01	-1.917966E-02	1.006215E-02
3	G	9.196364E-03	1.864287E-02	3.567670E-01	-1.295619E-01	2.472473E-02	1.701323E-03
4	G	1.061142E-02	1.736937E-02	3.136062E-01	-9.942049E-02	1.071686E-01	-5.921821E-03
5	G	9.545399E-03	1.321917E-02	2.371569E-01	-6.213238E-02	9.291663E-02	-4.525048E-03
6	G	6.029847E-03	7.337247E-03	1.331956E-01	-9.324441E-02	2.420288E-01	-1.434175E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.275718E-03	1.375474E-02	3.402935E-01	-1.289068E-01	-4.124551E-02	1.312436E-02
9	G	7.989615E-03	1.662548E-02	3.285325E-01	-9.942192E-02	3.866353E-02	6.662751E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -600 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.771924E-03	4.918817E-07	3.350022E-01	6.259945E-05	5.161196E-02	-2.031602E-06
2	G	8.773925E-03	1.876765E-02	3.955472E-01	-1.899881E-01	-2.121893E-02	1.214275E-02
3	G	1.117950E-02	2.255923E-02	3.933519E-01	-1.436627E-01	2.736503E-02	2.051259E-03
4	G	1.291031E-02	2.100634E-02	3.457075E-01	-1.101667E-01	1.183481E-01	-7.230821E-03
5	G	1.160450E-02	1.596204E-02	2.612672E-01	-6.699868E-02	1.026427E-01	-5.519781E-03
6	G	7.355298E-03	8.857543E-03	1.468391E-01	-1.032306E-01	2.659524E-01	-1.738369E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.616474E-03	1.662496E-02	3.751577E-01	-1.421626E-01	-4.528358E-02	1.587354E-02
9	G	9.707651E-03	2.010183E-02	3.621277E-01	-1.094140E-01	4.253441E-02	8.163330E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -600 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.680528E-03	6.654550E-07	3.615763E-01	9.034701E-05	6.818534E-02	-2.015906E-06
2	G	1.017236E-02	2.176091E-02	4.265630E-01	-2.060027E-01	-2.292976E-02	1.406202E-02
3	G	1.299697E-02	2.615529E-02	4.241397E-01	-1.554529E-01	2.956682E-02	2.376201E-03
4	G	1.501975E-02	2.434851E-02	3.727331E-01	-1.191594E-01	1.277303E-01	-8.431864E-03
5	G	1.349552E-02	1.848408E-02	2.815808E-01	-7.113186E-02	1.108261E-01	-6.436139E-03
6	G	8.575111E-03	1.025726E-02	1.583415E-01	-1.117598E-01	2.860191E-01	-2.019423E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.842688E-03	1.925868E-02	4.045155E-01	-1.532524E-01	-4.864299E-02	1.839578E-02
9	G	1.128202E-02	2.329511E-02	3.904215E-01	-1.177706E-01	4.576040E-02	9.617627E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -600 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.523592E-03	8.520619E-07	3.847937E-01	1.212909E-04	8.390024E-02	-1.659121E-06
2	G	1.147433E-02	2.455529E-02	4.536025E-01	-2.198841E-01	-2.440386E-02	1.585908E-02
3	G	1.469188E-02	2.951507E-02	4.509814E-01	-1.657059E-01	3.147298E-02	2.682955E-03
4	G	1.698925E-02	2.747311E-02	3.963006E-01	-1.269642E-01	1.358918E-01	-9.553078E-03
5	G	1.526258E-02	2.084331E-02	2.993057E-01	-7.476470E-02	1.179621E-01	-7.294626E-03
6	G	9.716937E-03	1.156803E-02	1.683832E-01	-1.192875E-01	3.034548E-01	-2.283456E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.983917E-03	2.171774E-02	4.301219E-01	-1.628894E-01	-5.151638E-02	2.074694E-02
9	G	1.275003E-02	2.627926E-02	4.151006E-01	-1.250179E-01	4.853978E-02	1.104907E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -600 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.315085E-03	1.050313E-06	4.055514E-01	1.550735E-04	9.883282E-02	-9.329551E-07
2	G	1.270066E-02	2.719379E-02	4.777276E-01	-2.321994E-01	-2.569142E-02	1.755818E-02
3	G	1.629071E-02	3.268984E-02	4.749302E-01	-1.748275E-01	3.315884E-02	2.976433E-03
4	G	1.884920E-02	3.042758E-02	4.173329E-01	-1.338987E-01	1.431598E-01	-1.061152E-02
5	G	1.693282E-02	2.307537E-02	3.151322E-01	-7.803001E-02	1.243311E-01	-8.107790E-03
6	G	1.079781E-02	1.280934E-02	1.773534E-01	-1.260776E-01	3.189612E-01	-2.534251E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.105838E-02	2.404019E-02	4.529790E-01	-1.714618E-01	-5.402440E-02	2.296232E-02
9	G	1.413474E-02	2.909993E-02	4.371304E-01	-1.314514E-01	5.099103E-02	1.246795E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -600 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.064409E-03	1.259177E-06	4.244155E-01	1.914232E-04	1.130589E-01	1.837689E-07
2	G	1.386533E-02	2.970531E-02	4.996086E-01	-2.433076E-01	-2.682668E-02	1.917574E-02
3	G	1.781126E-02	3.571405E-02	4.966508E-01	-1.830748E-01	3.467260E-02	3.259858E-03
4	G	2.062000E-02	3.324379E-02	4.364126E-01	-1.401634E-01	1.497406E-01	-1.161874E-02
5	G	1.852438E-02	2.520417E-02	3.294962E-01	-8.101136E-02	1.301096E-01	-8.884057E-03
6	G	1.182916E-02	1.399426E-02	1.854980E-01	-1.322979E-01	3.329816E-01	-2.774342E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.207833E-02	2.625155E-02	4.737194E-01	-1.792143E-01	-5.624522E-02	2.506584E-02
9	G	1.545163E-02	3.178774E-02	4.571202E-01	-1.372574E-01	5.318928E-02	1.388040E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -600 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.778273E-03	1.477841E-06	4.417686E-01	2.301259E-04	1.266471E-01	1.707377E-06
2	G	1.497831E-02	3.211048E-02	5.196987E-01	-2.534519E-01	-2.783448E-02	2.072360E-02
3	G	1.926621E-02	3.861223E-02	5.165932E-01	-1.906221E-01	3.604732E-02	3.535457E-03
4	G	2.231619E-02	3.594438E-02	4.539339E-01	-1.458940E-01	1.557738E-01	-1.258300E-02
5	G	2.005019E-02	2.724671E-02	3.426926E-01	-8.376526E-02	1.354168E-01	-9.629433E-03
6	G	1.281912E-02	1.513208E-02	1.929834E-01	-1.380626E-01	3.458163E-01	-3.005530E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.305251E-02	2.837001E-02	4.927707E-01	-1.863121E-01	-5.823294E-02	2.707466E-02
9	G	1.671172E-02	3.436449E-02	4.754822E-01	-1.425625E-01	5.518553E-02	1.529026E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -600 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.046169E-02	1.705648E-06	4.578831E-01	2.710085E-04	1.396583E-01	3.650784E-06
2	G	1.604703E-02	3.442465E-02	5.383207E-01	-2.628056E-01	-2.873362E-02	2.221068E-02
3	G	2.066501E-02	4.140267E-02	5.350772E-01	-1.975939E-01	3.730685E-02	3.804832E-03
4	G	2.394856E-02	3.854623E-02	4.701772E-01	-1.511871E-01	1.613588E-01	-1.351049E-02
5	G	2.151985E-02	2.921565E-02	3.549315E-01	-8.633197E-02	1.403375E-01	-1.034839E-02
6	G	1.377375E-02	1.622972E-02	1.999280E-01	-1.434532E-01	3.576788E-01	-3.229153E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.398746E-02	3.040909E-02	5.104374E-01	-1.928728E-01	-6.002694E-02	2.900169E-02
9	G	1.792322E-02	3.684640E-02	4.925094E-01	-1.474565E-01	5.701622E-02	1.669995E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -650 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.287252E-03	7.910892E-08	2.064204E-01	5.399912E-06	-2.577379E-03	-5.724411E-07
2	G	3.444084E-03	7.498775E-03	2.448924E-01	-1.124810E-01	-1.334117E-02	4.996710E-03
3	G	4.286566E-03	9.044335E-03	2.439437E-01	-8.736223E-02	1.645091E-02	8.511074E-04
4	G	4.931010E-03	8.459427E-03	2.146441E-01	-6.653176E-02	7.278421E-02	-2.738726E-03
5	G	4.460924E-03	6.510229E-03	1.629835E-01	-4.749802E-02	6.243654E-02	-2.078902E-03
6	G	2.776465E-03	3.637183E-03	9.135806E-02	-6.425864E-02	1.680687E-01	-6.990748E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	2.945235E-03	6.693173E-03	2.325933E-01	-8.834393E-02	-2.873055E-02	6.374983E-03
9	G	3.726599E-03	8.084839E-03	2.247560E-01	-6.873520E-02	2.640378E-02	3.359273E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -650 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.644084E-03	1.932423E-07	2.634148E-01	1.902012E-05	1.585981E-02	-1.217111E-06
2	G	5.512174E-03	1.185822E-02	3.117880E-01	-1.467629E-01	-1.660183E-02	7.735979E-03
3	G	6.949327E-03	1.427009E-02	3.102610E-01	-1.120493E-01	2.120656E-02	1.326465E-03
4	G	8.009116E-03	1.331239E-02	2.728174E-01	-8.591735E-02	9.309340E-02	-4.469746E-03
5	G	7.216203E-03	1.016800E-02	2.065758E-01	-5.605482E-02	8.026640E-02	-3.398323E-03
6	G	4.537503E-03	5.656614E-03	1.159544E-01	-8.129951E-02	2.116888E-01	-1.099211E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.754442E-03	1.054170E-02	2.959007E-01	-1.122462E-01	-3.616206E-02	1.005472E-02
9	G	6.039232E-03	1.273687E-02	2.857604E-01	-8.684220E-02	3.370585E-02	5.068778E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -650 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.770831E-03	3.334980E-07	3.031302E-01	3.861471E-05	3.418307E-02	-1.741293E-06
2	G	7.234218E-03	1.551648E-02	3.583382E-01	-1.709367E-01	-1.908915E-02	1.005155E-02
3	G	9.177148E-03	1.865803E-02	3.564485E-01	-1.296642E-01	2.453684E-02	1.721101E-03
4	G	1.058845E-02	1.738648E-02	3.133402E-01	-9.950395E-02	1.072241E-01	-5.934459E-03
5	G	9.525322E-03	1.323919E-02	2.369833E-01	-6.212578E-02	9.259318E-02	-4.509039E-03
6	G	6.020021E-03	7.356221E-03	1.331417E-01	-9.361879E-02	2.419879E-01	-1.438027E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.264127E-03	1.376298E-02	3.399324E-01	-1.289619E-01	-4.132046E-02	1.314008E-02
9	G	7.970792E-03	1.663472E-02	3.281905E-01	-9.948253E-02	3.867539E-02	6.632310E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -650 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.767562E-03	4.922269E-07	3.346661E-01	6.268568E-05	5.166781E-02	-2.024840E-06
2	G	8.762541E-03	1.877891E-02	3.952269E-01	-1.901189E-01	-2.113221E-02	1.213124E-02
3	G	1.116021E-02	2.257409E-02	3.930610E-01	-1.437489E-01	2.718959E-02	2.071751E-03
4	G	1.288726E-02	2.102323E-02	3.454651E-01	-1.102453E-01	1.184015E-01	-7.243892E-03
5	G	1.158433E-02	1.598183E-02	2.611085E-01	-6.698594E-02	1.023463E-01	-5.503745E-03
6	G	7.345560E-03	8.876468E-03	1.467903E-01	-1.035754E-01	2.659147E-01	-1.742234E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.604830E-03	1.663301E-02	3.748290E-01	-1.422088E-01	-4.535360E-02	1.588938E-02
9	G	9.688784E-03	2.011088E-02	3.618166E-01	-1.094684E-01	4.254732E-02	8.130876E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -650 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.676129E-03	6.658864E-07	3.612641E-01	9.044966E-05	6.824034E-02	-2.006868E-06
2	G	1.016091E-02	2.177204E-02	4.262651E-01	-2.061263E-01	-2.284700E-02	1.404985E-02
3	G	1.297762E-02	2.616999E-02	4.238690E-01	-1.555324E-01	2.940181E-02	2.397079E-03
4	G	1.499665E-02	2.436525E-02	3.725075E-01	-1.192346E-01	1.277819E-01	-8.445262E-03
5	G	1.347527E-02	1.850370E-02	2.814326E-01	-7.111554E-02	1.105496E-01	-6.420097E-03
6	G	8.565423E-03	1.027614E-02	1.582962E-01	-1.120828E-01	2.859834E-01	-2.023291E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.831005E-03	1.926658E-02	4.042097E-01	-1.532948E-01	-4.870817E-02	1.841157E-02
9	G	1.126311E-02	2.330399E-02	3.901321E-01	-1.178211E-01	4.577303E-02	9.584447E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -650 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.519160E-03	8.525539E-07	3.844997E-01	1.214093E-04	8.395411E-02	-1.647749E-06
2	G	1.146283E-02	2.456630E-02	4.533216E-01	-2.200018E-01	-2.432443E-02	1.584641E-02
3	G	1.467247E-02	2.952963E-02	4.507262E-01	-1.657803E-01	3.131622E-02	2.704116E-03
4	G	1.696610E-02	2.748971E-02	3.960879E-01	-1.270365E-01	1.359418E-01	-9.566707E-03
5	G	1.524227E-02	2.086277E-02	2.991655E-01	-7.474615E-02	1.177009E-01	-7.278577E-03
6	G	9.707280E-03	1.158687E-02	1.683406E-01	-1.195934E-01	3.034206E-01	-2.287326E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.972199E-03	2.172552E-02	4.298336E-01	-1.629288E-01	-5.157767E-02	2.076266E-02
9	G	1.273108E-02	2.628801E-02	4.148279E-01	-1.250653E-01	4.855198E-02	1.101554E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -650 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.310623E-03	1.050863E-06	4.052719E-01	1.552069E-04	9.888546E-02	-9.191298E-07
2	G	1.268911E-02	2.720470E-02	4.774602E-01	-2.323121E-01	-2.561483E-02	1.754514E-02
3	G	1.627126E-02	3.270427E-02	4.746871E-01	-1.748978E-01	3.300887E-02	2.997811E-03
4	G	1.882601E-02	3.044407E-02	4.171304E-01	-1.339684E-01	1.432081E-01	-1.062532E-02
5	G	1.691244E-02	2.309471E-02	3.149984E-01	-7.801001E-02	1.240823E-01	-8.091733E-03
6	G	1.078817E-02	1.282815E-02	1.773129E-01	-1.263696E-01	3.189282E-01	-2.538121E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.104663E-02	2.404786E-02	4.527047E-01	-1.714989E-01	-5.408246E-02	2.297798E-02
9	G	1.411575E-02	2.910855E-02	4.368709E-01	-1.314962E-01	5.100279E-02	1.243428E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -650 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.059916E-03	1.259782E-06	4.241479E-01	1.915708E-04	1.131102E-01	2.001494E-07
2	G	1.385374E-02	2.971613E-02	4.993524E-01	-2.434160E-01	-2.675255E-02	1.916239E-02
3	G	1.779177E-02	3.572836E-02	4.964178E-01	-1.831417E-01	3.452836E-02	3.281408E-03
4	G	2.059677E-02	3.326017E-02	4.362185E-01	-1.402308E-01	1.497875E-01	-1.163266E-02
5	G	1.850394E-02	2.522340E-02	3.293678E-01	-8.099036E-02	1.298712E-01	-8.867992E-03
6	G	1.181953E-02	1.401304E-02	1.854592E-01	-1.325784E-01	3.329495E-01	-2.778211E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.206654E-02	2.625914E-02	4.734566E-01	-1.792495E-01	-5.630053E-02	2.508141E-02
9	G	1.543261E-02	3.179626E-02	4.568716E-01	-1.373001E-01	5.320060E-02	1.384673E-03

NINE TENTHS, -650 DEG
LOAD STEP = 1.00000E+01
SUBCASE 90

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.773752E-03	1.478501E-06	4.415111E-01	2.302869E-04	1.266972E-01	1.726401E-06
2	G	1.496668E-02	3.212121E-02	5.194520E-01	-2.535565E-01	-2.776252E-02	2.070999E-02
3	G	1.924668E-02	3.862643E-02	5.163686E-01	-1.906861E-01	3.590800E-02	3.557147E-03
4	G	2.229291E-02	3.596066E-02	4.537469E-01	-1.459594E-01	1.558194E-01	-1.259702E-02
5	G	2.002970E-02	2.726585E-02	3.425687E-01	-8.374356E-02	1.351872E-01	-9.613357E-03
6	G	1.280950E-02	1.515083E-02	1.929459E-01	-1.383332E-01	3.457849E-01	-3.009397E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.304070E-02	2.837751E-02	4.925176E-01	-1.863456E-01	-5.828589E-02	2.709015E-02
9	G	1.669267E-02	3.437291E-02	4.752427E-01	-1.426033E-01	5.519642E-02	1.525667E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -650 DEG
LOAD STEP = 1.10000E+01
SUBCASE 101

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.045714E-02	1.706360E-06	4.576343E-01	2.711824E-04	1.397072E-01	3.672527E-06
2	G	1.603536E-02	3.443529E-02	5.380820E-01	-2.629068E-01	-2.866358E-02	2.219687E-02
3	G	2.064545E-02	4.141676E-02	5.348600E-01	-1.976555E-01	3.717184E-02	3.826638E-03
4	G	2.392525E-02	3.856242E-02	4.699962E-01	-1.512506E-01	1.614031E-01	-1.352458E-02
5	G	2.149930E-02	2.923469E-02	3.548114E-01	-8.630978E-02	1.401155E-01	-1.033230E-02
6	G	1.376412E-02	1.624844E-02	1.998917E-01	-1.437151E-01	3.576480E-01	-3.233017E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.397562E-02	3.041651E-02	5.101926E-01	-1.929048E-01	-6.007781E-02	2.901710E-02
9	G	1.790413E-02	3.685474E-02	4.922778E-01	-1.474956E-01	5.702669E-02	1.666651E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -700 DEG
LOAD STEP = 2.00000E+00
SUBCASE 10

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.283061E-03	7.271444E-08	2.058859E-01	4.817924E-06	-2.525184E-03	-5.530223E-07
2	G	3.432868E-03	7.511606E-03	2.443911E-01	-1.127083E-01	-1.325129E-02	4.991211E-03
3	G	4.267682E-03	9.061085E-03	2.434921E-01	-8.757121E-02	1.621780E-02	8.673381E-04
4	G	4.908330E-03	8.477666E-03	2.142631E-01	-6.663544E-02	7.283894E-02	-2.749537E-03
5	G	4.441098E-03	6.531435E-03	1.627382E-01	-4.754052E-02	6.199282E-02	-2.063137E-03
6	G	2.765978E-03	3.656422E-03	9.127624E-02	-6.475849E-02	1.680076E-01	-7.028689E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	2.933813E-03	6.702396E-03	2.320735E-01	-8.845323E-02	-2.881933E-02	6.389588E-03
9	G	3.707904E-03	8.095055E-03	2.242609E-01	-6.882986E-02	2.640041E-02	3.341507E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -700 DEG
LOAD STEP = 3.00000E+00
SUBCASE 20

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.639812E-03	1.928396E-07	2.629915E-01	1.900381E-05	1.591541E-02	-1.212241E-06
2	G	5.500991E-03	1.166993E-02	3.113855E-01	-1.469153E-01	-1.650495E-02	7.727112E-03
3	G	6.930173E-03	1.428554E-02	3.098961E-01	-1.121602E-01	2.099739E-02	1.345463E-03
4	G	7.986202E-03	1.332985E-02	2.725131E-01	-8.600470E-02	9.314869E-02	-4.481496E-03
5	G	7.196222E-03	1.018843E-02	2.063785E-01	-5.606125E-02	7.990152E-02	-3.382360E-03
6	G	4.527465E-03	5.675685E-03	1.158917E-01	-8.171778E-02	2.116419E-01	-1.103048E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.742900E-03	1.055026E-02	2.954879E-01	-1.123066E-01	-3.624742E-02	1.007055E-02
9	G	6.020494E-03	1.274652E-02	2.853698E-01	-8.690979E-02	3.371719E-02	5.040659E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -700 DEG
LOAD STEP = 4.00000E+00
SUBCASE 30

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.766509E-03	3.340114E-07	3.027604E-01	3.870000E-05	3.423945E-02	-1.736160E-06
2	G	7.222942E-03	1.552789E-02	3.579858E-01	-1.710727E-01	-1.899725E-02	1.004110E-02
3	G	9.157904E-03	1.867311E-02	3.561286E-01	-1.297559E-01	2.434702E-02	1.741089E-03
4	G	1.056546E-02	1.740362E-02	3.130738E-01	-9.958604E-02	1.072785E-01	-5.946987E-03
5	G	9.505234E-03	1.325926E-02	2.368096E-01	-6.211956E-02	9.226983E-02	-4.493036E-03
6	G	6.010159E-03	7.375218E-03	1.330876E-01	-9.399265E-02	2.419468E-01	-1.441884E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.252526E-03	1.377125E-02	3.395711E-01	-1.290117E-01	-4.139753E-02	1.315601E-02
9	G	7.951991E-03	1.664405E-02	3.278488E-01	-9.954164E-02	3.868855E-02	6.601054E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -700 DEG
LOAD STEP = 5.00000E+00
SUBCASE 40

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.763200E-03	4.925960E-07	3.343300E-01	6.277172E-05	5.172390E-02	-2.017988E-06
2	G	8.751163E-03	1.879021E-02	3.949065E-01	-1.902498E-01	-2.104577E-02	1.211978E-02
3	G	1.114091E-02	2.258900E-02	3.927701E-01	-1.438354E-01	2.701442E-02	2.092228E-03
4	G	1.286422E-02	2.104018E-02	3.452227E-01	-1.103240E-01	1.184547E-01	-7.256964E-03
5	G	1.156416E-02	1.600166E-02	2.609496E-01	-6.697334E-02	1.020503E-01	-5.487738E-03
6	G	7.335790E-03	8.895412E-03	1.467414E-01	-1.039196E-01	2.658767E-01	-1.746098E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.593188E-03	1.664109E-02	3.745001E-01	-1.422552E-01	-4.542349E-02	1.590522E-02
9	G	9.669922E-03	2.011996E-02	3.615054E-01	-1.095229E-01	4.256003E-02	8.098573E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -700 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.671730E-03	6.663198E-07	3.609518E-01	9.055264E-05	6.829553E-02	-1.997819E-06
2	G	1.014947E-02	2.178320E-02	4.259671E-01	-2.062500E-01	-2.276448E-02	1.403771E-02
3	G	1.295826E-02	2.618473E-02	4.235984E-01	-1.556122E-01	2.923702E-02	2.417943E-03
4	G	1.497356E-02	2.438202E-02	3.722820E-01	-1.193100E-01	1.278334E-01	-8.458664E-03
5	G	1.345502E-02	1.852334E-02	2.812843E-01	-7.109933E-02	1.102733E-01	-6.404080E-03
6	G	8.555708E-03	1.029504E-02	1.582509E-01	-1.124052E-01	2.859476E-01	-2.027159E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.819325E-03	1.927451E-02	4.039039E-01	-1.533374E-01	-4.877321E-02	1.842737E-02
9	G	1.124420E-02	2.331291E-02	3.898427E-01	-1.178717E-01	4.578548E-02	9.551414E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -700 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.514727E-03	8.530476E-07	3.842055E-01	1.215281E-04	8.400816E-02	-1.636362E-06
2	G	1.145133E-02	2.457735E-02	4.530406E-01	-2.201196E-01	-2.424521E-02	1.583379E-02
3	G	1.465308E-02	2.954421E-02	4.504708E-01	-1.658550E-01	3.115966E-02	2.725264E-03
4	G	1.694296E-02	2.750635E-02	3.958751E-01	-1.271089E-01	1.359915E-01	-9.580340E-03
5	G	1.522195E-02	2.088227E-02	2.990253E-01	-7.472769E-02	1.174400E-01	-7.262552E-03
6	G	9.697597E-03	1.160574E-02	1.682979E-01	-1.198988E-01	3.033863E-01	-2.291195E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.960483E-03	2.173333E-02	4.295453E-01	-1.629684E-01	-5.163884E-02	2.077840E-02
9	G	1.271213E-02	2.629678E-02	4.145550E-01	-1.251128E-01	4.856405E-02	1.098214E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -700 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.306158E-03	1.051414E-06	4.049923E-01	1.553407E-04	9.893824E-02	-9.052860E-07
2	G	1.267756E-02	2.721564E-02	4.771928E-01	-2.324249E-01	-2.553841E-02	1.753212E-02
3	G	1.625182E-02	3.271873E-02	4.744440E-01	-1.749684E-01	3.285906E-02	3.019178E-03
4	G	1.880282E-02	3.046059E-02	4.169278E-01	-1.340382E-01	1.432563E-01	-1.063912E-02
5	G	1.689206E-02	2.311408E-02	3.148647E-01	-7.799006E-02	1.238338E-01	-8.075697E-03
6	G	1.077851E-02	1.284698E-02	1.772722E-01	-1.266613E-01	3.188950E-01	-2.541991E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.103488E-02	2.405556E-02	4.524303E-01	-1.715361E-01	-5.414042E-02	2.299364E-02
9	G	1.409677E-02	2.911721E-02	4.366112E-01	-1.315411E-01	5.101442E-02	1.240072E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -700 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.055423E-03	1.260390E-06	4.238803E-01	1.917187E-04	1.131617E-01	2.165516E-07
2	G	1.384214E-02	2.972698E-02	4.990962E-01	-2.435244E-01	-2.667857E-02	1.914907E-02
3	G	1.777229E-02	3.574270E-02	4.961848E-01	-1.832088E-01	3.438424E-02	3.302948E-03
4	G	2.057354E-02	3.327657E-02	4.360243E-01	-1.402983E-01	1.498343E-01	-1.164659E-02
5	G	1.848350E-02	2.524265E-02	3.292393E-01	-8.096941E-02	1.296329E-01	-8.851946E-03
6	G	1.180988E-02	1.403183E-02	1.854202E-01	-1.328585E-01	3.329172E-01	-2.782079E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.205476E-02	2.626674E-02	4.731937E-01	-1.792848E-01	-5.635576E-02	2.509700E-02
9	G	1.541359E-02	3.180480E-02	4.566228E-01	-1.373428E-01	5.321180E-02	1.381316E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -700 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.769230E-03	1.479162E-06	4.412536E-01	2.304483E-04	1.267474E-01	1.745449E-06
2	G	1.495505E-02	3.213197E-02	5.192052E-01	-2.536611E-01	-2.769068E-02	2.069642E-02
3	G	1.922716E-02	3.864066E-02	5.161440E-01	-1.907503E-01	3.576880E-02	3.578828E-03
4	G	2.226964E-02	3.597696E-02	4.535598E-01	-1.460248E-01	1.558649E-01	-1.261104E-02
5	G	2.000920E-02	2.728500E-02	3.424447E-01	-8.372191E-02	1.349578E-01	-9.597300E-03
6	G	1.279986E-02	1.516959E-02	1.929084E-01	-1.386034E-01	3.457533E-01	-3.013263E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.302889E-02	2.838503E-02	4.922644E-01	-1.863793E-01	-5.833876E-02	2.710565E-02
9	G	1.667362E-02	3.438136E-02	4.750031E-01	-1.426441E-01	5.520720E-02	1.522318E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -700 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.045259E-02	1.707074E-06	4.573854E-01	2.713567E-04	1.397562E-01	3.694297E-06
2	G	1.602369E-02	3.444596E-02	5.378432E-01	-2.630080E-01	-2.859366E-02	2.218308E-02
3	G	2.062589E-02	4.143089E-02	5.346427E-01	-1.977171E-01	3.703693E-02	3.848434E-03
4	G	2.390194E-02	3.857863E-02	4.698152E-01	-1.513141E-01	1.614474E-01	-1.353868E-02
5	G	2.147876E-02	2.925375E-02	3.546913E-01	-8.628764E-02	1.398937E-01	-1.031623E-02
6	G	1.375448E-02	1.626717E-02	1.998553E-01	-1.439768E-01	3.576170E-01	-3.236881E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.396378E-02	3.042395E-02	5.099478E-01	-1.929370E-01	-6.012860E-02	2.903252E-02
9	G	1.788505E-02	3.686310E-02	4.920462E-01	-1.475348E-01	5.703707E-02	1.663315E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -750 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.278889E-03	7.514779E-08	2.053510E-01	5.022590E-06	-2.471722E-03	-5.254731E-07
2	G	3.421840E-03	7.524222E-03	2.438858E-01	-1.128969E-01	-1.315226E-02	4.985532E-03
3	G	4.248729E-03	9.077728E-03	2.430362E-01	-8.773575E-02	1.597273E-02	8.847227E-04
4	G	4.885691E-03	8.496183E-03	2.138831E-01	-6.674550E-02	7.289003E-02	-2.760152E-03
5	G	4.421356E-03	6.552867E-03	1.624941E-01	-4.758956E-02	6.155096E-02	-2.047227E-03
6	G	2.755477E-03	3.675777E-03	9.119479E-02	-6.526110E-02	1.679476E-01	-7.066955E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	2.922378E-03	6.711755E-03	2.315539E-01	-8.854304E-02	-2.891976E-02	6.405245E-03
9	G	3.689295E-03	8.105586E-03	2.237683E-01	-6.892199E-02	2.640406E-02	3.320307E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -750 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.635541E-03	1.928652E-07	2.625679E-01	1.904706E-05	1.597142E-02	-1.209851E-06
2	G	5.489817E-03	1.188171E-02	3.109829E-01	-1.470677E-01	-1.640856E-02	7.718326E-03
3	G	6.911026E-03	1.430107E-02	3.095311E-01	-1.122712E-01	2.078874E-02	1.364427E-03
4	G	7.963289E-03	1.334737E-02	2.722086E-01	-8.609203E-02	9.320334E-02	-4.493240E-03
5	G	7.176223E-03	1.020891E-02	2.061811E-01	-5.606790E-02	7.953735E-02	-3.366439E-03
6	G	4.517375E-03	5.694787E-03	1.158289E-01	-8.213477E-02	2.115945E-01	-1.106885E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.731364E-03	1.055888E-02	2.950749E-01	-1.123673E-01	-3.633249E-02	1.008638E-02
9	G	6.001764E-03	1.275625E-02	2.849790E-01	-8.697741E-02	3.372810E-02	5.012862E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -750 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.762192E-03	3.336256E-07	3.023905E-01	3.871292E-05	3.429648E-02	-1.732318E-06
2	G	7.211570E-03	1.553963E-02	3.576353E-01	-1.712287E-01	-1.890940E-02	1.003063E-02
3	G	9.138719E-03	1.868851E-02	3.558110E-01	-1.298693E-01	2.416150E-02	1.760658E-03
4	G	1.054251E-02	1.742086E-02	3.128080E-01	-9.967161E-02	1.073342E-01	-5.959769E-03
5	G	9.485135E-03	1.327937E-02	2.366358E-01	-6.211311E-02	9.194758E-02	-4.477109E-03
6	G	6.000254E-03	7.394236E-03	1.330333E-01	-9.436497E-02	2.419050E-01	-1.445733E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.240948E-03	1.377958E-02	3.392097E-01	-1.290717E-01	-4.147027E-02	1.317162E-02
9	G	7.933160E-03	1.665336E-02	3.275059E-01	-9.960410E-02	3.869867E-02	6.571675E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -750 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.758838E-03	4.929673E-07	3.339937E-01	6.285802E-05	5.178022E-02	-2.011127E-06
2	G	8.739793E-03	1.880155E-02	3.945860E-01	-1.903806E-01	-2.095959E-02	1.210837E-02
3	G	1.112161E-02	2.260396E-02	3.924792E-01	-1.439218E-01	2.683947E-02	2.112693E-03
4	G	1.284118E-02	2.105716E-02	3.449802E-01	-1.104028E-01	1.185075E-01	-7.270036E-03
5	G	1.154397E-02	1.602151E-02	2.607907E-01	-6.696087E-02	1.017546E-01	-5.471759E-03
6	G	7.325988E-03	8.914375E-03	1.466924E-01	-1.042631E-01	2.658385E-01	-1.749962E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.581549E-03	1.664920E-02	3.741712E-01	-1.423017E-01	-4.549327E-02	1.592109E-02
9	G	9.651064E-03	2.012909E-02	3.611942E-01	-1.095774E-01	4.257258E-02	8.066396E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -750 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.667332E-03	6.667552E-07	3.606394E-01	9.065596E-05	6.835092E-02	-1.988757E-06
2	G	1.013803E-02	2.179440E-02	4.256690E-01	-2.063739E-01	-2.268221E-02	1.402562E-02
3	G	1.293892E-02	2.619950E-02	4.233277E-01	-1.556922E-01	2.907246E-02	2.438790E-03
4	G	1.495047E-02	2.439884E-02	3.720563E-01	-1.193854E-01	1.278846E-01	-8.472070E-03
5	G	1.343475E-02	1.854301E-02	2.811359E-01	-7.108321E-02	1.099974E-01	-6.388091E-03
6	G	8.545963E-03	1.031396E-02	1.582054E-01	-1.127271E-01	2.859115E-01	-2.031028E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.807647E-03	1.928247E-02	4.035980E-01	-1.533801E-01	-4.883812E-02	1.844318E-02
9	G	1.122529E-02	2.332186E-02	3.895532E-01	-1.179223E-01	4.579775E-02	9.518529E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260
SIX TENTHS, -750 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.510295E-03	8.535432E-07	3.839114E-01	1.216473E-04	8.406237E-02	-1.624960E-06
2	G	1.143984E-02	2.458843E-02	4.527597E-01	-2.202375E-01	-2.416618E-02	1.582119E-02
3	G	1.463368E-02	2.955884E-02	4.502155E-01	-1.659299E-01	3.100327E-02	2.746398E-03
4	G	1.691982E-02	2.752302E-02	3.956623E-01	-1.271814E-01	1.360411E-01	-9.593978E-03
5	G	1.520162E-02	2.090179E-02	2.988850E-01	-7.470931E-02	1.171793E-01	-7.246550E-03
6	G	9.687889E-03	1.162461E-02	1.682551E-01	-1.202038E-01	3.033518E-01	-2.295065E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.948769E-03	2.174116E-02	4.292569E-01	-1.630082E-01	-5.169989E-02	2.079414E-02
9	G	1.269318E-02	2.630559E-02	4.142821E-01	-1.251604E-01	4.857596E-02	1.094887E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -750 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.301694E-03	1.051968E-06	4.047126E-01	1.554748E-04	9.899118E-02	-8.914236E-07
2	G	1.266602E-02	2.722661E-02	4.769254E-01	-2.325378E-01	-2.546217E-02	1.751914E-02
3	G	1.623238E-02	3.273322E-02	4.742009E-01	-1.750391E-01	3.270940E-02	3.040532E-03
4	G	1.877963E-02	3.047713E-02	4.167252E-01	-1.341081E-01	1.433044E-01	-1.065293E-02
5	G	1.687166E-02	2.313346E-02	3.147309E-01	-7.797018E-02	1.235855E-01	-8.059684E-03
6	G	1.076883E-02	1.286582E-02	1.772316E-01	-1.269525E-01	3.188616E-01	-2.545860E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.102313E-02	2.406329E-02	4.521559E-01	-1.715735E-01	-5.419827E-02	2.300931E-02
9	G	1.407779E-02	2.912589E-02	4.363515E-01	-1.315861E-01	5.102593E-02	1.236729E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -750 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.050928E-03	1.260999E-06	4.236126E-01	1.918669E-04	1.132133E-01	2.329755E-07
2	G	1.383056E-02	2.973785E-02	4.988399E-01	-2.436330E-01	-2.660474E-02	1.913578E-02
3	G	1.775281E-02	3.575706E-02	4.959517E-01	-1.832761E-01	3.424027E-02	3.324477E-03
4	G	2.055031E-02	3.329301E-02	4.358301E-01	-1.403659E-01	1.498809E-01	-1.166052E-02
5	G	1.846305E-02	2.526193E-02	3.291108E-01	-8.094852E-02	1.293949E-01	-8.835920E-03
6	G	1.180021E-02	1.405063E-02	1.853812E-01	-1.331382E-01	3.328848E-01	-2.785947E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.204299E-02	2.627437E-02	4.729307E-01	-1.793202E-01	-5.641090E-02	2.511258E-02
9	G	1.539457E-02	3.181338E-02	4.563740E-01	-1.373856E-01	5.322288E-02	1.377970E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -750 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.764709E-03	1.479826E-06	4.409959E-01	2.306101E-04	1.267978E-01	1.764522E-06
2	G	1.494342E-02	3.214274E-02	5.189583E-01	-2.537659E-01	-2.761899E-02	2.068287E-02
3	G	1.920764E-02	3.865492E-02	5.159195E-01	-1.908147E-01	3.562971E-02	3.600499E-03
4	G	2.224636E-02	3.599329E-02	4.533726E-01	-1.460902E-01	1.559102E-01	-1.262507E-02
5	G	1.998870E-02	2.730417E-02	3.423207E-01	-8.370031E-02	1.347285E-01	-9.581261E-03
6	G	1.279019E-02	1.518836E-02	1.928708E-01	-1.388733E-01	3.457217E-01	-3.017129E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.301708E-02	2.839257E-02	4.920112E-01	-1.864130E-01	-5.839154E-02	2.712116E-02
9	G	1.665457E-02	3.438983E-02	4.747635E-01	-1.426850E-01	5.521788E-02	1.518979E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -750 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.044804E-02	1.707791E-06	4.571365E-01	2.715314E-04	1.398052E-01	3.716095E-06
2	G	1.601203E-02	3.445666E-02	5.376045E-01	-2.631093E-01	-2.852386E-02	2.216931E-02
3	G	2.060634E-02	4.144504E-02	5.344254E-01	-1.977790E-01	3.690212E-02	3.870222E-03
4	G	2.387862E-02	3.859486E-02	4.696342E-01	-1.513777E-01	1.614915E-01	-1.355278E-02
5	G	2.145821E-02	2.927283E-02	3.545712E-01	-8.626554E-02	1.396720E-01	-1.030018E-02
6	G	1.374482E-02	1.628591E-02	1.998189E-01	-1.442381E-01	3.575860E-01	-3.240745E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.395194E-02	3.043141E-02	5.097030E-01	-1.929693E-01	-6.017932E-02	2.904794E-02
9	G	1.786597E-02	3.657148E-02	4.918145E-01	-1.475740E-01	5.704737E-02	1.659990E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, -800 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.274634E-03	7.612573E-08	2.048162E-01	5.148670E-06	-2.418904E-03	-5.467502E-07
2	G	3.411162E-03	7.535812E-03	2.433703E-01	-1.130074E-01	-1.304096E-02	4.980474E-03
3	G	4.229523E-03	9.093167E-03	2.425659E-01	-8.780509E-02	1.572328E-02	9.021625E-04
4	G	4.862542E-03	8.514048E-03	2.134928E-01	-6.681153E-02	7.292970E-02	-2.769299E-03
5	G	4.401190E-03	6.573945E-03	1.622443E-01	-4.762139E-02	6.110731E-02	-2.031520E-03
6	G	2.744701E-03	3.694980E-03	9.111045E-02	-6.575089E-02	1.678804E-01	-7.104478E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	2.910909E-03	6.720882E-03	2.310326E-01	-8.858611E-02	-2.902829E-02	6.421582E-03
9	G	3.670756E-03	8.116199E-03	2.232785E-01	-6.898540E-02	2.641367E-02	3.297512E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -800 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.631270E-03	1.934207E-07	2.621442E-01	1.912171E-05	1.602782E-02	-1.207310E-06
2	G	5.478656E-03	1.189354E-02	3.105802E-01	-1.472196E-01	-1.631265E-02	7.709634E-03
3	G	6.891882E-03	1.431666E-02	3.091659E-01	-1.123821E-01	2.058046E-02	1.383380E-03
4	G	7.940378E-03	1.336497E-02	2.719041E-01	-8.617951E-02	9.325738E-02	-4.504980E-03
5	G	7.156210E-03	1.022945E-02	2.059836E-01	-5.607485E-02	7.917393E-02	-3.350560E-03
6	G	4.507235E-03	5.713919E-03	1.157658E-01	-8.255049E-02	2.115466E-01	-1.110723E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.719832E-03	1.056755E-02	2.946618E-01	-1.124280E-01	-3.641743E-02	1.010225E-02
9	G	5.983042E-03	1.276604E-02	2.845880E-01	-8.704510E-02	3.373874E-02	4.985234E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -800 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.757872E-03	3.324121E-07	3.020204E-01	3.865983E-05	3.435354E-02	-1.729629E-06
2	G	7.200258E-03	1.555127E-02	3.572836E-01	-1.713745E-01	-1.882023E-02	1.002029E-02
3	G	9.119511E-03	1.870384E-02	3.554921E-01	-1.299724E-01	2.397433E-02	1.780409E-03
4	G	1.051955E-02	1.743813E-02	3.125418E-01	-9.975559E-02	1.073887E-01	-5.972430E-03
5	G	9.465025E-03	1.329952E-02	2.364619E-01	-6.210705E-02	9.162544E-02	-4.461190E-03
6	G	5.990313E-03	7.413279E-03	1.329790E-01	-9.473679E-02	2.418630E-01	-1.449586E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.229363E-03	1.378794E-02	3.388481E-01	-1.291268E-01	-4.154494E-02	1.318742E-02
9	G	7.914351E-03	1.666275E-02	3.271635E-01	-9.966506E-02	3.870997E-02	6.541596E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -800 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.754476E-03	4.933397E-07	3.336573E-01	6.294475E-05	5.183679E-02	-2.004261E-06
2	G	8.728424E-03	1.881293E-02	3.942655E-01	-1.905118E-01	-2.087378E-02	1.209702E-02
3	G	1.110232E-02	2.261896E-02	3.921882E-01	-1.440090E-01	2.666487E-02	2.133132E-03
4	G	1.281814E-02	2.107418E-02	3.447376E-01	-1.104818E-01	1.185601E-01	-7.283117E-03
5	G	1.152377E-02	1.604141E-02	2.606317E-01	-6.694853E-02	1.014593E-01	-5.455812E-03
6	G	7.316152E-03	8.933356E-03	1.466433E-01	-1.046058E-01	2.657999E-01	-1.753827E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.569914E-03	1.665734E-02	3.738421E-01	-1.423485E-01	-4.556281E-02	1.593696E-02
9	G	9.632209E-03	2.013826E-02	3.608828E-01	-1.096321E-01	4.258485E-02	8.034436E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -800 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.662933E-03	6.671924E-07	3.603269E-01	9.075963E-05	6.840651E-02	-1.979684E-06
2	G	1.012660E-02	2.180564E-02	4.253710E-01	-2.064979E-01	-2.260019E-02	1.401358E-02
3	G	1.291957E-02	2.621432E-02	4.230569E-01	-1.557726E-01	2.890811E-02	2.459622E-03
4	G	1.492737E-02	2.441568E-02	3.718307E-01	-1.194609E-01	1.279355E-01	-8.485480E-03
5	G	1.341448E-02	1.856271E-02	2.809876E-01	-7.106721E-02	1.097217E-01	-6.372127E-03
6	G	8.536191E-03	1.033289E-02	1.581599E-01	-1.130483E-01	2.858752E-01	-2.034896E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.795971E-03	1.929045E-02	4.032920E-01	-1.534230E-01	-4.890289E-02	1.845899E-02
9	G	1.120639E-02	2.333084E-02	3.892636E-01	-1.179731E-01	4.580985E-02	9.485795E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -800 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.505862E-03	8.540407E-07	3.836171E-01	1.217668E-04	8.411674E-02	-1.613542E-06
2	G	1.142835E-02	2.459954E-02	4.524786E-01	-2.203556E-01	-2.408736E-02	1.580864E-02
3	G	1.461429E-02	2.957350E-02	4.499601E-01	-1.660050E-01	3.084708E-02	2.767518E-03
4	G	1.689668E-02	2.753972E-02	3.954495E-01	-1.272539E-01	1.360905E-01	-9.607619E-03
5	G	1.518128E-02	2.092133E-02	2.987447E-01	-7.469101E-02	1.169189E-01	-7.230572E-03
6	G	9.678156E-03	1.164350E-02	1.682123E-01	-1.205083E-01	3.033170E-01	-2.298934E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.937057E-03	2.174902E-02	4.289684E-01	-1.630481E-01	-5.176082E-02	2.080989E-02
9	G	1.267424E-02	2.631442E-02	4.140091E-01	-1.252080E-01	4.858772E-02	1.091574E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -800 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.297229E-03	1.052523E-06	4.044329E-01	1.556092E-04	9.904426E-02	-8.775427E-07
2	G	1.265448E-02	2.723761E-02	4.766580E-01	-2.326508E-01	-2.538610E-02	1.750619E-02
3	G	1.621294E-02	3.274774E-02	4.739577E-01	-1.751101E-01	3.255991E-02	3.061874E-03
4	G	1.875645E-02	3.049370E-02	4.165226E-01	-1.341780E-01	1.433523E-01	-1.066674E-02
5	G	1.685126E-02	2.315287E-02	3.145970E-01	-7.795038E-02	1.233374E-01	-8.043693E-03
6	G	1.075912E-02	1.288467E-02	1.771908E-01	-1.272433E-01	3.188281E-01	-2.549729E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.101138E-02	2.407103E-02	4.518813E-01	-1.716110E-01	-5.425603E-02	2.302498E-02
9	G	1.405881E-02	2.913459E-02	4.360918E-01	-1.316311E-01	5.103730E-02	1.233398E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -800 DEG SUBCASE 80
LOAD STEP = 9.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.046434E-03	1.261610E-06	4.233448E-01	1.920155E-04	1.132651E-01	2.494212E-07
2	G	1.381897E-02	2.974874E-02	4.985836E-01	-2.437416E-01	-2.653106E-02	1.912251E-02
3	G	1.773333E-02	3.577146E-02	4.957186E-01	-1.833436E-01	3.409643E-02	3.345995E-03
4	G	2.052707E-02	3.330946E-02	4.356359E-01	-1.404334E-01	1.499274E-01	-1.167446E-02
5	G	1.844260E-02	2.528122E-02	3.289823E-01	-8.092768E-02	1.291571E-01	-8.819915E-03
6	G	1.179052E-02	1.406945E-02	1.853421E-01	-1.334176E-01	3.328522E-01	-2.789815E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.203121E-02	2.628202E-02	4.726678E-01	-1.793557E-01	-5.646595E-02	2.512818E-02
9	G	1.537556E-02	3.182197E-02	4.561252E-01	-1.374284E-01	5.323386E-02	1.374636E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -800 DEG SUBCASE 90
LOAD STEP = 1.00000E+01

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.760186E-03	1.480491E-06	4.407383E-01	2.307722E-04	1.268482E-01	1.783620E-06
2	G	1.493179E-02	3.215354E-02	5.187113E-01	-2.538706E-01	-2.754742E-02	2.066934E-02
3	G	1.918812E-02	3.866920E-02	5.156949E-01	-1.908792E-01	3.549075E-02	3.622160E-03
4	G	2.222309E-02	3.600964E-02	4.531855E-01	-1.461558E-01	1.559554E-01	-1.263910E-02
5	G	1.996819E-02	2.732336E-02	3.421967E-01	-8.367875E-02	1.344994E-01	-9.565242E-03
6	G	1.278051E-02	1.520714E-02	1.928331E-01	-1.391428E-01	3.456899E-01	-3.020995E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.300527E-02	2.840013E-02	4.917579E-01	-1.864468E-01	-5.844425E-02	2.713667E-02
9	G	1.663552E-02	3.439832E-02	4.745239E-01	-1.427259E-01	5.522846E-02	1.515650E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 8, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, -800 DEG SUBCASE 101
LOAD STEP = 1.10000E+01

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.044349E-02	1.708509E-06	4.568875E-01	2.717064E-04	1.398544E-01	3.737921E-06
2	G	1.600036E-02	3.446737E-02	5.373657E-01	-2.632107E-01	-2.845417E-02	2.215558E-02
3	G	2.058678E-02	4.145921E-02	5.342081E-01	-1.978409E-01	3.676742E-02	3.892002E-03
4	G	2.385531E-02	3.861111E-02	4.694531E-01	-1.514413E-01	1.615356E-01	-1.356688E-02
5	G	2.143765E-02	2.929192E-02	3.544510E-01	-8.624348E-02	1.394505E-01	-1.028414E-02
6	G	1.373514E-02	1.630466E-02	1.997824E-01	-1.444991E-01	3.575548E-01	-3.244608E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.394010E-02	3.043889E-02	5.094581E-01	-1.930016E-01	-6.022996E-02	2.906337E-02
9	G	1.784690E-02	3.687988E-02	4.915828E-01	-1.476133E-01	5.705757E-02	1.656674E-03

ONE TENTH, -850 DEG SUBCASE 10
LOAD STEP = 2.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.270442E-03	7.627559E-08	2.042809E-01	5.174657E-06	-2.365638E-03	-5.453617E-07
2	G	3.400191E-03	7.548475E-03	2.428637E-01	-1.131925E-01	-1.294472E-02	4.975366E-03
3	G	4.210559E-03	9.109799E-03	2.421077E-01	-8.796486E-02	1.548423E-02	9.189713E-04
4	G	4.839766E-03	8.532519E-03	2.131094E-01	-6.690789E-02	7.297698E-02	-2.779592E-03
5	G	4.381250E-03	6.595381E-03	1.619977E-01	-4.766401E-02	6.066730E-02	-2.015819E-03
6	G	2.733972E-03	3.714354E-03	9.102726E-02	-6.624407E-02	1.678160E-01	-7.142470E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	2.899497E-03	6.730330E-03	2.305119E-01	-8.867331E-02	-2.912490E-02	6.437106E-03
9	G	3.652162E-03	8.126861E-03	2.227851E-01	-6.907176E-02	2.641450E-02	3.278067E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, -850 DEG SUBCASE 20
LOAD STEP = 3.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.627000E-03	1.940123E-07	2.617203E-01	1.917093E-05	1.608459E-02	-1.202626E-06
2	G	5.467513E-03	1.190541E-02	3.101772E-01	-1.473705E-01	-1.621710E-02	7.701037E-03
3	G	6.872741E-03	1.433231E-02	3.088004E-01	-1.124922E-01	2.037250E-02	1.402337E-03
4	G	7.917467E-03	1.338263E-02	2.715994E-01	-8.626711E-02	9.331074E-02	-4.516703E-03
5	G	7.136182E-03	1.025004E-02	2.057859E-01	-5.608220E-02	7.881123E-02	-3.334720E-03
6	G	4.497047E-03	5.733081E-03	1.157025E-01	-8.296502E-02	2.114981E-01	-1.114562E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.708305E-03	1.057628E-02	2.942485E-01	-1.124885E-01	-3.650242E-02	1.011820E-02
9	G	5.964329E-03	1.277590E-02	2.841969E-01	-8.711286E-02	3.374923E-02	4.957663E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, -850 DEG SUBCASE 30
LOAD STEP = 4.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.753550E-03	3.374733E-07	3.016502E-01	3.910557E-05	3.441067E-02	-1.717992E-06
2	G	7.189105E-03	1.556255E-02	3.569290E-01	-1.714908E-01	-1.872591E-02	1.001012E-02
3	G	9.100223E-03	1.871882E-02	3.551697E-01	-1.300438E-01	2.378175E-02	1.800718E-03
4	G	1.049651E-02	1.745538E-02	3.122745E-01	-9.983449E-02	1.074404E-01	-5.984700E-03
5	G	9.444899E-03	1.331971E-02	2.362879E-01	-6.210179E-02	9.130295E-02	-4.445244E-03
6	G	5.980339E-03	7.432348E-03	1.329245E-01	-9.510867E-02	2.418211E-01	-1.453455E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.217757E-03	1.379632E-02	3.384867E-01	-1.291674E-01	-4.162553E-02	1.320374E-02
9	G	7.895600E-03	1.667230E-02	3.268225E-01	-9.972121E-02	3.872508E-02	6.509271E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, -850 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.750115E-03	4.937203E-07	3.333208E-01	6.303169E-05	5.189360E-02	-1.997364E-06
2	G	8.717060E-03	1.882435E-02	3.939449E-01	-1.906433E-01	-2.078827E-02	1.208571E-02
3	G	1.108304E-02	2.263402E-02	3.918971E-01	-1.440965E-01	2.649054E-02	2.153553E-03
4	G	1.279510E-02	2.109125E-02	3.444951E-01	-1.105609E-01	1.186124E-01	-7.296201E-03
5	G	1.150357E-02	1.606133E-02	2.604726E-01	-6.693634E-02	1.011644E-01	-5.439894E-03
6	G	7.306284E-03	8.952356E-03	1.465940E-01	-1.049479E-01	2.657611E-01	-1.757691E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.558282E-03	1.666553E-02	3.735130E-01	-1.423956E-01	-4.563219E-02	1.595284E-02
9	G	9.613358E-03	2.014747E-02	3.605712E-01	-1.096869E-01	4.259691E-02	8.002642E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, -850 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.658534E-03	6.676315E-07	3.600144E-01	9.086364E-05	6.846229E-02	-1.970599E-06
2	G	1.011517E-02	2.181691E-02	4.250728E-01	-2.066221E-01	-2.251842E-02	1.400158E-02
3	G	1.290023E-02	2.622919E-02	4.227861E-01	-1.558532E-01	2.874400E-02	2.480438E-03
4	G	1.490428E-02	2.443257E-02	3.716050E-01	-1.195365E-01	1.279863E-01	-8.498894E-03
5	G	1.339420E-02	1.858244E-02	2.808391E-01	-7.105130E-02	1.094464E-01	-6.356189E-03
6	G	8.526389E-03	1.035184E-02	1.581143E-01	-1.133691E-01	2.858386E-01	-2.038764E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.784299E-03	1.929847E-02	4.029859E-01	-1.534661E-01	-4.896751E-02	1.847482E-02
9	G	1.118749E-02	2.333986E-02	3.889739E-01	-1.180239E-01	4.582176E-02	9.453209E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, -850 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.501429E-03	8.545401E-07	3.833228E-01	1.218867E-04	8.417130E-02	-1.602109E-06
2	G	1.141686E-02	2.461068E-02	4.521975E-01	-2.204738E-01	-2.400875E-02	1.579612E-02
3	G	1.459490E-02	2.958820E-02	4.497046E-01	-1.660804E-01	3.069106E-02	2.788624E-03
4	G	1.687354E-02	2.755645E-02	3.952366E-01	-1.273265E-01	1.361397E-01	-9.621264E-03
5	G	1.516093E-02	2.094090E-02	2.986044E-01	-7.467280E-02	1.166587E-01	-7.214619E-03
6	G	9.668398E-03	1.166240E-02	1.681693E-01	-1.208123E-01	3.032821E-01	-2.302803E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.925348E-03	2.175690E-02	4.286798E-01	-1.630881E-01	-5.182164E-02	2.082565E-02
9	G	1.265530E-02	2.632328E-02	4.137360E-01	-1.252557E-01	4.859934E-02	1.088273E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, -850 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.292765E-03	1.053080E-06	4.041531E-01	1.557440E-04	9.909748E-02	-8.636430E-07
2	G	1.264294E-02	2.724863E-02	4.763904E-01	-2.327639E-01	-2.531020E-02	1.749328E-02
3	G	1.619351E-02	3.276230E-02	4.737146E-01	-1.751812E-01	3.241057E-02	3.083204E-03
4	G	1.873326E-02	3.051031E-02	4.163200E-01	-1.342480E-01	1.434000E-01	-1.068055E-02
5	G	1.683086E-02	2.317230E-02	3.144631E-01	-7.793064E-02	1.230895E-01	-8.027723E-03
6	G	1.074939E-02	1.290353E-02	1.771500E-01	-1.275337E-01	3.187944E-01	-2.553598E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.099964E-02	2.407880E-02	4.516068E-01	-1.716487E-01	-5.431368E-02	2.304066E-02
9	G	1.403983E-02	2.914333E-02	4.358320E-01	-1.316762E-01	5.104855E-02	1.230079E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, -850 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.041940E-03	1.262223E-06	4.230770E-01	1.921645E-04	1.133170E-01	2.658888E-07
2	G	1.380739E-02	2.975966E-02	4.983272E-01	-2.438504E-01	-2.645754E-02	1.910928E-02
3	G	1.771385E-02	3.578589E-02	4.954855E-01	-1.834113E-01	3.395272E-02	3.367502E-03
4	G	2.050385E-02	3.332594E-02	4.354417E-01	-1.405011E-01	1.499738E-01	-1.168840E-02
5	G	1.842214E-02	2.530053E-02	3.288537E-01	-8.090691E-02	1.289194E-01	-8.803930E-03
6	G	1.178081E-02	1.408828E-02	1.853030E-01	-1.336966E-01	3.328195E-01	-2.793683E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.201943E-02	2.628968E-02	4.724047E-01	-1.793913E-01	-5.652091E-02	2.514378E-02
9	G	1.535654E-02	3.183059E-02	4.558763E-01	-1.374713E-01	5.324472E-02	1.371312E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 7, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, -850 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.755664E-03	1.481158E-06	4.404806E-01	2.309346E-04	1.268988E-01	1.802742E-06
2	G	1.492017E-02	3.216437E-02	5.184644E-01	-2.539755E-01	-2.747598E-02	2.065585E-02
3	G	1.916861E-02	3.868351E-02	5.154703E-01	-1.909439E-01	3.535190E-02	3.643811E-03
4	G	2.219982E-02	3.602602E-02	4.529983E-01	-1.462213E-01	1.560005E-01	-1.265313E-02
5	G	1.994768E-02	2.734256E-02	3.420726E-01	-8.365725E-02	1.342705E-01	-9.549242E-03
6	G	1.277081E-02	1.522594E-02	1.927954E-01	-1.394121E-01	3.456579E-01	-3.024861E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.299347E-02	2.840770E-02	4.915046E-01	-1.864807E-01	-5.849687E-02	2.715218E-02
9	G	1.661647E-02	3.440684E-02	4.742842E-01	-1.427669E-01	5.523895E-02	1.512332E-03

ONE, -850 DEG SUBCASE 101
LOAD STEP = 1.10000E+01

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.043894E-02	1.709229E-06	4.566384E-01	2.718818E-04	1.399036E-01	3.759774E-06
2	G	1.598870E-02	3.447810E-02	5.371268E-01	-2.633121E-01	-2.838461E-02	2.214186E-02
3	G	2.056723E-02	4.147341E-02	5.339908E-01	-1.979031E-01	3.663283E-02	3.913772E-03
4	G	2.383200E-02	3.862739E-02	4.692720E-01	-1.515050E-01	1.615795E-01	-1.358099E-02
5	G	2.141709E-02	2.931103E-02	3.543308E-01	-8.622146E-02	1.392292E-01	-1.026813E-02
6	G	1.372545E-02	1.632342E-02	1.997459E-01	-1.447599E-01	3.575235E-01	-3.248471E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.392827E-02	3.044638E-02	5.092131E-01	-1.930341E-01	-6.028054E-02	2.907880E-02
9	G	1.782782E-02	3.688830E-02	4.913510E-01	-1.476525E-01	5.706769E-02	1.653368E-03

ONE TENTH, ZERO DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.341992E-03	7.401508E-08	2.133318E-01	4.767032E-06	-3.194503E-03	-5.698712E-07
2	G	3.587988E-03	7.349566E-03	2.514677E-01	-1.103176E-01	-1.476892E-02	5.080811E-03
3	G	4.534828E-03	8.846126E-03	2.499020E-01	-8.563810E-02	1.971927E-02	6.239635E-04
4	G	5.228249E-03	8.234358E-03	2.196153E-01	-6.538023E-02	7.205004E-02	-2.608204E-03
5	G	4.716984E-03	6.243060E-03	1.661580E-01	-4.700415E-02	6.834459E-02	-2.289620E-03
6	G	2.905966E-03	3.391708E-03	9.238727E-02	-5.754874E-02	1.687762E-01	-6.500938E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.094946E-03	6.582240E-03	2.393183E-01	-8.740198E-02	-2.736874E-02	6.174818E-03
9	G	3.969544E-03	7.959296E-03	2.311131E-01	-6.769782E-02	2.627526E-02	3.668207E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, ZERO DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.699800E-03	1.900756E-07	2.688976E-01	1.839473E-05	1.517781E-02	-1.255206E-06
2	G	5.657619E-03	1.171388E-02	3.170216E-01	-1.449520E-01	-1.793619E-02	7.857751E-03
3	G	7.199376E-03	1.407835E-02	3.150148E-01	-1.108159E-01	2.398902E-02	1.075015E-03
4	G	8.308156E-03	1.309270E-02	2.767770E-01	-8.485006E-02	9.233310E-02	-4.319508E-03
5	G	7.475621E-03	9.907982E-03	2.091379E-01	-5.601881E-02	8.507415E-02	-3.609077E-03
6	G	4.664267E-03	5.411784E-03	1.167564E-01	-7.577603E-02	2.122634E-01	-1.049676E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.905153E-03	1.043558E-02	3.012488E-01	-1.115717E-01	-3.500446E-02	9.848427E-03
9	G	6.283277E-03	1.261670E-02	2.908130E-01	-8.601391E-02	3.350478E-02	5.465528E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, ZERO DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.827071E-03	3.296506E-07	3.079243E-01	3.776644E-05	3.347854E-02	-1.804291E-06
2	G	7.381059E-03	1.537338E-02	3.629159E-01	-1.692394E-01	-2.032832E-02	1.019281E-02
3	G	9.427924E-03	1.846821E-02	3.606077E-01	-1.285687E-01	2.704221E-02	1.458444E-03
4	G	1.088789E-02	1.716879E-02	3.168018E-01	-9.846851E-02	1.064855E-01	-5.772921E-03
5	G	9.785834E-03	1.298225E-02	2.392366E-01	-6.223028E-02	9.684050E-02	-4.719901E-03
6	G	6.145012E-03	7.111489E-03	1.338336E-01	-8.868869E-02	2.424940E-01	-1.388027E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.415361E-03	1.365929E-02	3.446157E-01	-1.283657E-01	-4.029152E-02	1.293319E-02
9	G	8.215570E-03	1.651759E-02	3.326161E-01	-9.873720E-02	3.847246E-02	7.060374E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, ZERO DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.824279E-03	4.875732E-07	3.390261E-01	6.160066E-05	5.096036E-02	-2.113337E-06
2	G	8.910754E-03	1.863601E-02	3.993870E-01	-1.884515E-01	-2.228624E-02	1.228464E-02
3	G	1.141145E-02	2.238498E-02	3.968402E-01	-1.426764E-01	2.949344E-02	1.803628E-03
4	G	1.318708E-02	2.080704E-02	3.486135E-01	-1.092386E-01	1.176858E-01	-7.074701E-03
5	G	1.184594E-02	1.572718E-02	2.631682E-01	-6.716432E-02	1.062277E-01	-5.714348E-03
6	G	7.469765E-03	8.631983E-03	1.474169E-01	-9.904365E-02	2.663847E-01	-1.692065E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.756472E-03	1.653108E-02	3.790943E-01	-1.416347E-01	-4.442729E-02	1.568392E-02
9	G	9.934303E-03	1.999619E-02	3.658510E-01	-1.087726E-01	4.236004E-02	8.567687E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, ZERO DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.733309E-03	6.604511E-07	3.653156E-01	8.914154E-05	6.754070E-02	-2.123406E-06
2	G	1.030995E-02	2.163025E-02	4.301342E-01	-2.045407E-01	-2.394332E-02	1.421139E-02
3	G	1.322947E-02	2.598237E-02	4.273852E-01	-1.545321E-01	3.156491E-02	2.124286E-03
4	G	1.529706E-02	2.415056E-02	3.754366E-01	-1.182674E-01	1.270934E-01	-8.271642E-03
5	G	1.373792E-02	1.825094E-02	2.833554E-01	-7.133682E-02	1.141674E-01	-6.630572E-03
6	G	8.689254E-03	1.003195E-02	1.588780E-01	-1.078429E-01	2.864297E-01	-1.973036E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.983096E-03	1.916613E-02	4.081779E-01	-1.527627E-01	-4.784866E-02	1.820671E-02
9	G	1.150918E-02	2.319106E-02	3.938858E-01	-1.171724E-01	4.559385E-02	1.002825E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, ZERO DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.576771E-03	8.463200E-07	3.883161E-01	1.198958E-04	8.326672E-02	-1.794408E-06
2	G	1.161256E-02	2.442559E-02	4.569698E-01	-2.184867E-01	-2.537364E-02	1.601396E-02
3	G	1.492490E-02	2.934340E-02	4.540426E-01	-1.648382E-01	3.336866E-02	2.427868E-03
4	G	1.726710E-02	2.727639E-02	3.988505E-01	-1.261049E-01	1.352782E-01	-9.389993E-03
5	G	1.550585E-02	2.061162E-02	3.009839E-01	-7.499430E-02	1.211151E-01	-7.488977E-03
6	G	9.830929E-03	1.134300E-02	1.688890E-01	-1.155808E-01	3.038500E-01	-2.237032E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.012471E-02	2.162636E-02	4.335753E-01	-1.624303E-01	-5.077100E-02	2.055860E-02
9	G	1.297765E-02	2.617656E-02	4.183674E-01	-1.244550E-01	4.838090E-02	1.146241E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, ZERO DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.368637E-03	1.043875E-06	4.089008E-01	1.534995E-04	9.821242E-02	-1.097446E-06
2	G	1.283945E-02	2.706503E-02	4.809326E-01	-2.308585E-01	-2.662448E-02	1.771732E-02
3	G	1.652423E-02	3.251937E-02	4.778447E-01	-1.740040E-01	3.497084E-02	2.718891E-03
4	G	1.912758E-02	3.023202E-02	4.197606E-01	-1.330689E-01	1.425671E-01	-1.044636E-02
5	G	1.717687E-02	2.284497E-02	3.167335E-01	-7.827581E-02	1.273323E-01	-8.302107E-03
6	G	1.091176E-02	1.258460E-02	1.778352E-01	-1.225415E-01	3.193446E-01	-2.487816E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.119955E-02	2.394984E-02	4.562658E-01	-1.710281E-01	-5.331921E-02	2.277482E-02
9	G	1.436278E-02	2.899843E-02	4.402396E-01	-1.309180E-01	5.083937E-02	1.288188E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, ZERO DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.118314E-03	1.252067E-06	4.276222E-01	1.896795E-04	1.124524E-01	-1.115805E-08
2	G	1.400462E-02	2.957748E-02	5.026800E-01	-2.420164E-01	-2.772826E-02	1.933831E-02
3	G	1.804524E-02	3.554473E-02	4.994448E-01	-1.822887E-01	3.641428E-02	3.000361E-03
4	G	2.089888E-02	3.304930E-02	4.387399E-01	-1.393600E-01	1.491668E-01	-1.145202E-02
5	G	1.876916E-02	2.497493E-02	3.310342E-01	-8.126815E-02	1.329847E-01	-9.078379E-03
6	G	1.194312E-02	1.376981E-02	1.859604E-01	-1.289042E-01	3.333558E-01	-2.727912E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.221985E-02	2.616216E-02	4.768688E-01	-1.788021E-01	-5.557397E-02	2.487925E-02
9	G	1.568006E-02	3.168732E-02	4.600995E-01	-1.367493E-01	5.304433E-02	1.429357E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, ZERO DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.832514E-03	1.470081E-06	4.448548E-01	2.282205E-04	1.260549E-01	1.480952E-06
2	G	1.511807E-02	3.198354E-02	5.226576E-01	-2.522050E-01	-2.870859E-02	2.088898E-02
3	G	1.950064E-02	3.844401E-02	5.192854E-01	-1.898682E-01	3.772863E-02	3.274368E-03
4	G	2.259555E-02	3.575092E-02	4.561765E-01	-1.451146E-01	1.552172E-01	-1.241510E-02
5	G	2.029565E-02	2.701854E-02	3.441771E-01	-8.402963E-02	1.381845E-01	-9.823789E-03
6	G	1.293314E-02	1.490792E-02	1.934295E-01	-1.347904E-01	3.461829E-01	-2.959114E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.319438E-02	2.828150E-02	4.958042E-01	-1.859184E-01	-5.759095E-02	2.688901E-02
9	G	1.694051E-02	3.426507E-02	4.783516E-01	-1.420764E-01	5.504677E-02	1.570176E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, ZERO DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.051625E-02	1.697254E-06	4.608655E-01	2.689482E-04	1.390801E-01	3.391936E-06
2	G	1.618723E-02	3.429857E-02	5.411828E-01	-2.615984E-01	-2.958344E-02	2.237843E-02
3	G	2.089988E-02	4.123551E-02	5.376822E-01	-1.968684E-01	3.893548E-02	3.542423E-03
4	G	2.422840E-02	3.835374E-02	4.723471E-01	-1.504295E-01	1.608177E-01	-1.334169E-02
5	G	2.176594E-02	2.898846E-02	3.563698E-01	-8.660164E-02	1.430123E-01	-1.054280E-02
6	G	1.388785E-02	1.600586E-02	2.003604E-01	-1.402865E-01	3.580391E-01	-3.182759E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.412965E-02	3.032140E-02	5.133712E-01	-1.924952E-01	-5.941056E-02	2.881701E-02
9	G	1.815236E-02	3.674791E-02	4.952843E-01	-1.469900E-01	5.688317E-02	1.710918E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

ONE TENTH, 50 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.344982E-03	7.372912E-08	2.138460E-01	4.721140E-06	-3.269909E-03	-5.707928E-07
2	G	3.600940E-03	7.329270E-03	2.518731E-01	-1.095916E-01	-1.478822E-02	5.089241E-03
3	G	4.550870E-03	8.820355E-03	2.502274E-01	-8.485451E-02	1.994637E-02	6.103521E-04
4	G	5.245470E-03	8.210093E-03	2.198898E-01	-6.494360E-02	7.192380E-02	-2.587451E-03
5	G	4.730938E-03	6.218150E-03	1.663262E-01	-4.676238E-02	6.877638E-02	-2.306383E-03
6	G	2.912157E-03	3.371158E-03	9.242661E-02	-5.688357E-02	1.687386E-01	-6.452031E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.105605E-03	6.570819E-03	2.397963E-01	-8.697853E-02	-2.729649E-02	6.163362E-03
9	G	3.987649E-03	7.948643E-03	2.315908E-01	-6.738293E-02	2.630314E-02	3.687229E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

TWO TENTHS, 50 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.703974E-03	1.895745E-07	2.693188E-01	1.833968E-05	1.512457E-02	-1.259003E-06
2	G	5.669242E-03	1.170201E-02	3.174151E-01	-1.447326E-01	-1.803124E-02	7.868384E-03
3	G	7.218304E-03	1.406285E-02	3.153686E-01	-1.106389E-01	2.419892E-02	1.056592E-03
4	G	8.330598E-03	1.307564E-02	2.770733E-01	-8.474120E-02	9.226575E-02	-4.306667E-03
5	G	7.494790E-03	9.887892E-03	2.093277E-01	-5.600226E-02	8.545002E-02	-3.625840E-03
6	G	4.673128E-03	5.392959E-03	1.168124E-01	-7.532460E-02	2.122953E-01	-1.045714E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.916652E-03	1.042766E-02	3.016593E-01	-1.114795E-01	-3.492519E-02	9.834217E-03
9	G	6.302128E-03	1.260809E-02	2.912040E-01	-8.593208E-02	3.349661E-02	5.492606E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

THREE TENTHS, 50 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.831350E-03	3.293509E-07	3.082924E-01	3.769924E-05	3.342521E-02	-1.809064E-06
2	G	7.392572E-03	1.536215E-02	3.632641E-01	-1.690759E-01	-2.042136E-02	1.020441E-02
3	G	9.447088E-03	1.845342E-02	3.609227E-01	-1.284512E-01	2.723373E-02	1.438638E-03
4	G	1.091069E-02	1.715213E-02	3.170648E-01	-9.837919E-02	1.064240E-01	-5.759921E-03
5	G	9.805522E-03	1.296258E-02	2.394071E-01	-6.223445E-02	9.717071E-02	-4.736444E-03
6	G	6.154139E-03	7.092744E-03	1.338844E-01	-8.829744E-02	2.425276E-01	-1.384126E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.426958E-03	1.365156E-02	3.449753E-01	-1.283043E-01	-4.021651E-02	1.291812E-02
9	G	8.234454E-03	1.650901E-02	3.329572E-01	-9.867344E-02	3.845945E-02	7.091786E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FOUR TENTHS, 50 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.828626E-03	4.872697E-07	3.393608E-01	6.151665E-05	5.090738E-02	-2.119924E-06
2	G	8.922231E-03	1.862514E-02	3.997057E-01	-1.883159E-01	-2.237591E-02	1.229687E-02
3	G	1.143075E-02	2.237059E-02	3.971294E-01	-1.425875E-01	2.967170E-02	1.783026E-03
4	G	1.321007E-02	2.079063E-02	3.488545E-01	-1.091593E-01	1.176283E-01	-7.061554E-03
5	G	1.186591E-02	1.570777E-02	2.633256E-01	-6.717757E-02	1.065288E-01	-5.730771E-03
6	G	7.479027E-03	8.613285E-03	1.474639E-01	-9.868883E-02	2.664182E-01	-1.688193E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.768138E-03	1.652346E-02	3.794217E-01	-1.415879E-01	-4.435632E-02	1.566841E-02
9	G	9.953219E-03	1.998766E-02	3.661610E-01	-1.087179E-01	4.234533E-02	8.601545E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

FIVE TENTHS, 50 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.737697E-03	6.600227E-07	3.656266E-01	8.904380E-05	6.748820E-02	-2.132352E-06
2	G	1.032147E-02	2.161949E-02	4.304310E-01	-2.044148E-01	-2.402863E-02	1.422415E-02
3	G	1.324883E-02	2.596812E-02	4.276547E-01	-1.544521E-01	3.173229E-02	2.103293E-03
4	G	1.532014E-02	2.413426E-02	3.756612E-01	-1.181922E-01	1.270386E-01	-8.258222E-03
5	G	1.375802E-02	1.823166E-02	2.835026E-01	-7.135382E-02	1.144477E-01	-6.646950E-03
6	G	8.698544E-03	1.001327E-02	1.589219E-01	-1.075122E-01	2.864622E-01	-1.969164E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	8.994799E-03	1.915860E-02	4.084826E-01	-1.527206E-01	-4.778250E-02	1.819116E-02
9	G	1.152813E-02	2.318262E-02	3.941741E-01	-1.171221E-01	4.557959E-02	1.006277E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SIX TENTHS, 50 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.581194E-03	8.458436E-07	3.886092E-01	1.197820E-04	8.321504E-02	-1.805600E-06
2	G	1.162412E-02	2.441492E-02	4.572498E-01	-2.183680E-01	-2.545530E-02	1.602713E-02
3	G	1.494432E-02	2.932926E-02	4.542971E-01	-1.647644E-01	3.352745E-02	2.406591E-03
4	G	1.729024E-02	2.726018E-02	3.990625E-01	-1.260330E-01	1.352257E-01	-9.376374E-03
5	G	1.552605E-02	2.059246E-02	3.011233E-01	-7.501353E-02	1.213794E-01	-7.505327E-03
6	G	9.840242E-03	1.132434E-02	1.689306E-01	-1.152686E-01	3.038815E-01	-2.233161E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.013645E-02	2.161890E-02	4.338627E-01	-1.623916E-01	-5.070873E-02	2.054305E-02
9	G	1.299663E-02	2.616820E-02	4.186393E-01	-1.244080E-01	4.836719E-02	1.149724E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

SEVEN TENTHS, 50 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.373094E-03	1.043343E-06	4.091794E-01	1.533709E-04	9.816170E-02	-1.111037E-06
2	G	1.285104E-02	2.705444E-02	4.811992E-01	-2.307455E-01	-2.670303E-02	1.773081E-02
3	G	1.654369E-02	3.250533E-02	4.780871E-01	-1.739347E-01	3.512258E-02	2.697402E-03
4	G	1.915076E-02	3.021589E-02	4.199625E-01	-1.329996E-01	1.425166E-01	-1.043259E-02
5	G	1.719715E-02	2.282590E-02	3.168666E-01	-7.829646E-02	1.275837E-01	-8.318437E-03
6	G	1.092109E-02	1.256595E-02	1.778749E-01	-1.222441E-01	3.193755E-01	-2.483946E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.121132E-02	2.394246E-02	4.565393E-01	-1.709919E-01	-5.326021E-02	2.275931E-02
9	G	1.438179E-02	2.899014E-02	4.404984E-01	-1.308735E-01	5.082625E-02	1.291679E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

EIGHT TENTHS, 50 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.122801E-03	1.251481E-06	4.278890E-01	1.895368E-04	1.124028E-01	-2.725551E-08
2	G	1.401626E-02	2.956696E-02	5.029356E-01	-2.419081E-01	-2.780411E-02	1.935205E-02
3	G	1.806474E-02	3.553078E-02	4.996772E-01	-1.822229E-01	3.656007E-02	2.978708E-03
4	G	2.092211E-02	3.303325E-02	4.389335E-01	-1.392932E-01	1.491181E-01	-1.143814E-02
5	G	1.878951E-02	2.495595E-02	3.311620E-01	-8.128972E-02	1.332253E-01	-9.094697E-03
6	G	1.195247E-02	1.375118E-02	1.859985E-01	-1.286191E-01	3.333861E-01	-2.724044E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.223165E-02	2.615484E-02	4.771309E-01	-1.787678E-01	-5.551777E-02	2.486379E-02
9	G	1.569910E-02	3.167911E-02	4.603474E-01	-1.367071E-01	5.303178E-02	1.432841E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

NINE TENTHS, 50 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.837030E-03	1.469442E-06	4.451116E-01	2.280643E-04	1.260063E-01	1.462256E-06
2	G	1.512974E-02	3.197308E-02	5.229038E-01	-2.521006E-01	-2.878208E-02	2.090293E-02
3	G	1.952018E-02	3.843015E-02	5.195095E-01	-1.898055E-01	3.786932E-02	3.252583E-03
4	G	2.261883E-02	3.573494E-02	4.563631E-01	-1.450498E-01	1.551700E-01	-1.240113E-02
5	G	2.031605E-02	2.699964E-02	3.443005E-01	-8.405184E-02	1.384161E-01	-9.840101E-03
6	G	1.294250E-02	1.488931E-02	1.934664E-01	-1.345158E-01	3.462127E-01	-2.955249E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.320621E-02	2.827425E-02	4.960567E-01	-1.858857E-01	-5.753719E-02	2.687362E-02
9	G	1.695959E-02	3.425693E-02	4.785904E-01	-1.420361E-01	5.503477E-02	1.573644E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 265

ONE, 50 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.052079E-02	1.696563E-06	4.611138E-01	2.687792E-04	1.390327E-01	3.370562E-06
2	G	1.619893E-02	3.428819E-02	5.414210E-01	-2.614976E-01	-2.965485E-02	2.239256E-02
3	G	2.091945E-02	4.122172E-02	5.378991E-01	-1.968081E-01	3.907171E-02	3.520532E-03
4	G	2.425172E-02	3.833784E-02	4.725277E-01	-1.503665E-01	1.607720E-01	-1.332765E-02
5	G	2.178640E-02	2.896964E-02	3.564894E-01	-8.662429E-02	1.432360E-01	-1.055911E-02
6	G	1.389723E-02	1.598726E-02	2.003961E-01	-1.400209E-01	3.580684E-01	-3.178896E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.414151E-02	3.031421E-02	5.136153E-01	-1.924639E-01	-5.935894E-02	2.880169E-02
9	G	1.817147E-02	3.673984E-02	4.955153E-01	-1.469513E-01	5.687167E-02	1.714366E-03

ONE TENTH, 100 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.346308E-03	7.315836E-08	2.143476E-01	4.636918E-06	-3.391188E-03	-5.705064E-07
2	G	3.616564E-03	7.295535E-03	2.521480E-01	-1.080737E-01	-1.467426E-02	5.099681E-03
3	G	4.562809E-03	8.778515E-03	2.503752E-01	-8.314878E-02	2.013658E-02	6.022101E-04
4	G	5.255025E-03	8.174803E-03	2.200199E-01	-6.401072E-02	7.170751E-02	-2.551846E-03
5	G	4.737286E-03	6.186046E-03	1.663934E-01	-4.622937E-02	6.917207E-02	-2.323524E-03
6	G	2.913811E-03	3.347543E-03	9.241429E-02	-5.601825E-02	1.685808E-01	-6.386887E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.115156E-03	6.554442E-03	2.402304E-01	-8.605577E-02	-2.727074E-02	6.156646E-03
9	G	4.005122E-03	7.935530E-03	2.320633E-01	-6.673310E-02	2.638878E-02	3.697436E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

TWO TENTHS, 100 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.708173E-03	1.840091E-07	2.697348E-01	1.788180E-05	1.507292E-02	-1.255223E-06
2	G	5.680357E-03	1.169128E-02	3.178137E-01	-1.446105E-01	-1.814258E-02	7.878458E-03
3	G	7.237460E-03	1.404849E-02	3.157307E-01	-1.105667E-01	2.442227E-02	1.036704E-03
4	G	8.353421E-03	1.305899E-02	2.773728E-01	-8.466130E-02	9.220309E-02	-4.295149E-03
5	G	7.514353E-03	9.868060E-03	2.095197E-01	-5.599876E-02	8.582520E-02	-3.642480E-03
6	G	4.682269E-03	5.374234E-03	1.168698E-01	-7.488492E-02	2.123306E-01	-1.041886E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.928184E-03	1.041977E-02	3.020646E-01	-1.114390E-01	-3.482983E-02	9.818718E-03
9	G	6.320811E-03	1.259911E-02	2.915854E-01	-8.587228E-02	3.347580E-02	5.524671E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

THREE TENTHS, 100 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.835729E-03	3.483844E-07	3.086623E-01	3.497380E-05	3.337522E-02	-2.329401E-06
2	G	7.404882E-03	1.534977E-02	3.636039E-01	-1.688070E-01	-2.045884E-02	1.021138E-02
3	G	9.466154E-03	1.843808E-02	3.612303E-01	-1.282386E-01	2.735849E-02	1.426965E-03
4	G	1.093451E-02	1.713703E-02	3.173424E-01	-9.838071E-02	1.063695E-01	-5.751423E-03
5	G	9.826409E-03	1.294387E-02	2.395884E-01	-6.226590E-02	9.750358E-02	-4.752915E-03
6	G	6.164168E-03	7.074482E-03	1.339424E-01	-8.794532E-02	2.425731E-01	-1.380619E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.438554E-03	1.364417E-02	3.453385E-01	-1.281950E-01	-4.017808E-02	1.290656E-02
9	G	8.253767E-03	1.650107E-02	3.333047E-01	-9.860296E-02	3.848257E-02	7.094024E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

FOUR TENTHS, 100 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.832965E-03	4.869472E-07	3.396954E-01	6.143744E-05	5.085446E-02	-2.126539E-06
2	G	8.933751E-03	1.861420E-02	4.000237E-01	-1.881740E-01	-2.246493E-02	1.230921E-02
3	G	1.145002E-02	2.235614E-02	3.974178E-01	-1.424921E-01	2.984951E-02	1.762529E-03
4	G	1.323303E-02	2.077421E-02	3.490951E-01	-1.090783E-01	1.175702E-01	-7.048291E-03
5	G	1.188583E-02	1.568835E-02	2.634825E-01	-6.719013E-02	1.068303E-01	-5.747240E-03
6	G	7.488214E-03	8.594590E-03	1.475106E-01	-9.833232E-02	2.664510E-01	-1.684310E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.779792E-03	1.651586E-02	3.797491E-01	-1.415380E-01	-4.428633E-02	1.565308E-02
9	G	9.972143E-03	1.997920E-02	3.664712E-01	-1.086622E-01	4.233133E-02	8.634869E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

FIVE TENTHS, 100 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.742080E-03	6.595982E-07	3.659376E-01	8.894584E-05	6.743587E-02	-2.141277E-06
2	G	1.033300E-02	2.160871E-02	4.307275E-01	-2.042864E-01	-2.411381E-02	1.423699E-02
3	G	1.326819E-02	2.595385E-02	4.279239E-01	-1.543696E-01	3.189964E-02	2.082332E-03
4	G	1.534319E-02	2.411796E-02	3.758855E-01	-1.181162E-01	1.269835E-01	-8.244753E-03
5	G	1.377808E-02	1.821239E-02	2.836495E-01	-7.137049E-02	1.147282E-01	-6.663362E-03
6	G	8.707782E-03	9.994596E-03	1.589656E-01	-1.071804E-01	2.864941E-01	-1.965287E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.006498E-03	1.915109E-02	4.087872E-01	-1.526774E-01	-4.771665E-02	1.817569E-02
9	G	1.154708E-02	2.317423E-02	3.944625E-01	-1.170714E-01	4.556552E-02	1.009712E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

SIX TENTHS, 100 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.585615E-03	8.453646E-07	3.889022E-01	1.196685E-04	8.316352E-02	-1.816783E-06
2	G	1.163568E-02	2.440424E-02	4.575296E-01	-2.182479E-01	-2.553693E-02	1.604035E-02
3	G	1.496373E-02	2.931513E-02	4.545513E-01	-1.646891E-01	3.368625E-02	2.385333E-03
4	G	1.731335E-02	2.724398E-02	3.992743E-01	-1.259606E-01	1.351730E-01	-9.362727E-03
5	G	1.554621E-02	2.057330E-02	3.012625E-01	-7.503260E-02	1.216438E-01	-7.521703E-03
6	G	9.849513E-03	1.130568E-02	1.689720E-01	-1.149557E-01	3.039127E-01	-2.229287E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.014819E-02	2.161147E-02	4.341500E-01	-1.623522E-01	-5.064663E-02	2.052756E-02
9	G	1.301562E-02	2.615988E-02	4.189112E-01	-1.243607E-01	4.835358E-02	1.153197E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 265

SEVEN TENTHS, 100 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.377548E-03	1.042809E-06	4.094581E-01	1.532427E-04	9.811117E-02	-1.124610E-06
2	G	1.286265E-02	2.704385E-02	4.814656E-01	-2.306315E-01	-2.678158E-02	1.774433E-02
3	G	1.656314E-02	3.249130E-02	4.783294E-01	-1.738645E-01	3.527433E-02	2.675928E-03
4	G	1.917393E-02	3.019978E-02	4.201643E-01	-1.329302E-01	1.424660E-01	-1.041880E-02
5	G	1.721740E-02	2.280684E-02	3.169996E-01	-7.831702E-02	1.278352E-01	-8.334791E-03
6	G	1.093038E-02	1.254731E-02	1.779145E-01	-1.219462E-01	3.194060E-01	-2.480075E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.122308E-02	2.393509E-02	4.568128E-01	-1.709552E-01	-5.320133E-02	2.274385E-02
9	G	1.440081E-02	2.898189E-02	4.407571E-01	-1.308290E-01	5.081318E-02	1.295162E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 266

EIGHT TENTHS, 100 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.127286E-03	1.250894E-06	4.281558E-01	1.893946E-04	1.123533E-01	-4.332662E-08
2	G	1.402789E-02	2.955644E-02	5.031911E-01	-2.417991E-01	-2.787998E-02	1.936582E-02
3	G	1.808424E-02	3.551684E-02	4.999096E-01	-1.821566E-01	3.670589E-02	2.957067E-03
4	G	2.094533E-02	3.301722E-02	4.391271E-01	-1.392261E-01	1.490692E-01	-1.142424E-02
5	G	1.880983E-02	2.493698E-02	3.312898E-01	-8.131126E-02	1.334661E-01	-9.111037E-03
6	G	1.196179E-02	1.373256E-02	1.860366E-01	-1.283336E-01	3.334161E-01	-2.720176E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.224345E-02	2.614754E-02	4.773930E-01	-1.787333E-01	-5.546166E-02	2.484837E-02
9	G	1.571815E-02	3.167093E-02	4.605953E-01	-1.366648E-01	5.301927E-02	1.436319E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 267

NINE TENTHS, 100 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.841545E-03	1.468802E-06	4.453684E-01	2.279087E-04	1.259579E-01	1.443594E-06
2	G	1.514141E-02	3.196264E-02	5.231500E-01	-2.519959E-01	-2.885560E-02	2.091691E-02
3	G	1.953972E-02	3.841630E-02	5.197335E-01	-1.897423E-01	3.801002E-02	3.230809E-03
4	G	2.264209E-02	3.571898E-02	4.565497E-01	-1.449849E-01	1.551228E-01	-1.238715E-02
5	G	2.033645E-02	2.698075E-02	3.444239E-01	-8.407404E-02	1.386478E-01	-9.856430E-03
6	G	1.295184E-02	1.487071E-02	1.935032E-01	-1.342409E-01	3.462422E-01	-2.951384E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.321803E-02	2.826701E-02	4.963092E-01	-1.858529E-01	-5.748349E-02	2.685826E-02
9	G	1.697867E-02	3.424882E-02	4.788292E-01	-1.419957E-01	5.502278E-02	1.577108E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 268

ONE, 100 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.052533E-02	1.695872E-06	4.613619E-01	2.686107E-04	1.389854E-01	3.349228E-06
2	G	1.621063E-02	3.427781E-02	5.416592E-01	-2.613965E-01	-2.972628E-02	2.240671E-02
3	G	2.093902E-02	4.120795E-02	5.381159E-01	-1.967476E-01	3.920795E-02	3.498649E-03
4	G	2.427502E-02	3.832196E-02	4.727083E-01	-1.503035E-01	1.607262E-01	-1.331361E-02
5	G	2.180685E-02	2.895083E-02	3.566090E-01	-8.664693E-02	1.434598E-01	-1.057543E-02
6	G	1.390659E-02	1.596868E-02	2.004318E-01	-1.397551E-01	3.580976E-01	-3.175035E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.415336E-02	3.030703E-02	5.138595E-01	-1.924326E-01	-5.930737E-02	2.878639E-02
9	G	1.819057E-02	3.673179E-02	4.957463E-01	-1.469126E-01	5.686019E-02	1.717809E-03

ONE TENTH, 150 DEG
LOAD STEP = 2.00000E+00

SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.354563E-03	7.366276E-08	2.149118E-01	4.696348E-06	-3.328901E-03	-5.742499E-07
2	G	3.621486E-03	7.317279E-03	2.529716E-01	-1.098151E-01	-1.511953E-02	5.103266E-03
3	G	4.592068E-03	8.802887E-03	2.512641E-01	-8.524304E-02	2.049389E-02	5.709227E-04
4	G	5.296557E-03	8.184847E-03	2.207512E-01	-6.510935E-02	7.185407E-02	-2.577779E-03
5	G	4.775199E-03	6.183512E-03	1.668808E-01	-4.689491E-02	6.973214E-02	-2.339091E-03
6	G	2.933926E-03	3.336375E-03	9.261449E-02	-5.595305E-02	1.689154E-01	-6.389252E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.129553E-03	6.558679E-03	2.408560E-01	-8.719178E-02	-2.704529E-02	6.129972E-03
9	G	4.025673E-03	7.932787E-03	2.325669E-01	-6.745957E-02	2.623035E-02	3.747195E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 150 DEG
LOAD STEP = 3.00000E+00

SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.712575E-03	1.894269E-07	2.701582E-01	1.826190E-05	1.502717E-02	-1.264309E-06
2	G	5.691628E-03	1.168124E-02	3.182202E-01	-1.444839E-01	-1.824957E-02	7.888268E-03
3	G	7.256961E-03	1.403500E-02	3.161014E-01	-1.104852E-01	2.463765E-02	1.017125E-03
4	G	8.376823E-03	1.304318E-02	2.776830E-01	-8.458919E-02	9.214108E-02	-4.284007E-03
5	G	7.534677E-03	9.848950E-03	2.097218E-01	-5.600616E-02	8.620033E-02	-3.658775E-03
6	G	4.691985E-03	5.355895E-03	1.169338E-01	-7.446147E-02	2.123782E-01	-1.038185E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.939951E-03	1.041229E-02	3.024785E-01	-1.113954E-01	-3.473910E-02	9.802400E-03
9	G	6.339755E-03	1.259060E-02	2.919766E-01	-8.581370E-02	3.345615E-02	5.559138E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 150 DEG
LOAD STEP = 4.00000E+00

SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.839993E-03	3.288491E-07	3.090273E-01	3.757990E-05	3.332148E-02	-1.818605E-06
2	G	7.415303E-03	1.534081E-02	3.639657E-01	-1.688086E-01	-2.061691E-02	1.022721E-02
3	G	9.485699E-03	1.842505E-02	3.615601E-01	-1.282794E-01	2.762326E-02	1.398076E-03
4	G	1.095675E-02	1.711948E-02	3.175957E-01	-9.822046E-02	1.063034E-01	-5.735007E-03
5	G	9.845399E-03	1.292373E-02	2.397522E-01	-6.225341E-02	9.783161E-02	-4.769385E-03
6	G	6.172716E-03	7.055494E-03	1.339885E-01	-8.752506E-02	2.425996E-01	-1.376457E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.450269E-03	1.363628E-02	3.456935E-01	-1.282124E-01	-4.005688E-02	1.288674E-02
9	G	8.272197E-03	1.649183E-02	3.336361E-01	-9.855925E-02	3.842499E-02	7.159968E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 150 DEG
LOAD STEP = 5.00000E+00

SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.837342E-03	4.865723E-07	3.400296E-01	6.135544E-05	5.080239E-02	-2.133453E-06
2	G	8.945124E-03	1.860377E-02	4.003441E-01	-1.880589E-01	-2.255802E-02	1.232134E-02
3	G	1.146943E-02	2.234224E-02	3.977095E-01	-1.424248E-01	3.003020E-02	1.741557E-03
4	G	1.325620E-02	2.075806E-02	3.493377E-01	-1.090056E-01	1.175133E-01	-7.035545E-03
5	G	1.190598E-02	1.566913E-02	2.636411E-01	-6.720678E-02	1.071319E-01	-5.763636E-03
6	G	7.497573E-03	8.575993E-03	1.475584E-01	-9.798019E-02	2.664857E-01	-1.680482E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.791505E-03	1.650834E-02	3.800761E-01	-1.415015E-01	-4.421180E-02	1.563709E-02
9	G	9.991050E-03	1.997068E-02	3.667799E-01	-1.086119E-01	4.231346E-02	8.671052E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 150 DEG
LOAD STEP = 6.00000E+00

SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.746485E-03	6.592109E-07	3.662484E-01	8.884835E-05	6.738384E-02	-2.150111E-06
2	G	1.034446E-02	2.159823E-02	4.310251E-01	-2.041718E-01	-2.420116E-02	1.424973E-02
3	G	1.328762E-02	2.593991E-02	4.281947E-01	-1.543016E-01	3.206852E-02	2.061103E-03
4	G	1.536636E-02	2.410183E-02	3.761109E-01	-1.180446E-01	1.269289E-01	-8.231565E-03
5	G	1.379827E-02	1.819324E-02	2.837973E-01	-7.138930E-02	1.150090E-01	-6.679747E-03
6	G	8.717111E-03	9.975981E-03	1.590099E-01	-1.068506E-01	2.865269E-01	-1.961438E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.018232E-03	1.914363E-02	4.090916E-01	-1.526410E-01	-4.764832E-02	1.815984E-02
9	G	1.156603E-02	2.316581E-02	3.947501E-01	-1.170234E-01	4.554931E-02	1.013325E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 150 DEG
LOAD STEP = 7.00000E+00

SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.590050E-03	8.449124E-07	3.891950E-01	1.195550E-04	8.311211E-02	-1.827921E-06
2	G	1.164721E-02	2.439377E-02	4.578101E-01	-2.181361E-01	-2.561997E-02	1.605353E-02
3	G	1.498318E-02	2.930121E-02	4.548065E-01	-1.646226E-01	3.384609E-02	2.363893E-03
4	G	1.733655E-02	2.722789E-02	3.994867E-01	-1.258908E-01	1.351205E-01	-9.349250E-03
5	G	1.556646E-02	2.055423E-02	3.014021E-01	-7.505291E-02	1.219086E-01	-7.538075E-03
6	G	9.858836E-03	1.128706E-02	1.690136E-01	-1.146434E-01	3.039443E-01	-2.225427E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.015995E-02	2.160407E-02	4.344371E-01	-1.623169E-01	-5.058291E-02	2.051182E-02
9	G	1.303461E-02	2.615155E-02	4.191825E-01	-1.243150E-01	4.833854E-02	1.156801E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 150 DEG
LOAD STEP = 8.00000E+00

SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.382013E-03	1.042297E-06	4.097366E-01	1.531141E-04	9.806063E-02	-1.138168E-06
2	G	1.287422E-02	2.703340E-02	4.817325E-01	-2.305230E-01	-2.686114E-02	1.775786E-02
3	G	1.658263E-02	3.247742E-02	4.785722E-01	-1.738001E-01	3.542689E-02	2.654313E-03
4	G	1.919716E-02	3.018375E-02	4.203665E-01	-1.328623E-01	1.424153E-01	-1.040512E-02
5	G	1.723771E-02	2.278785E-02	3.171327E-01	-7.833837E-02	1.280871E-01	-8.351152E-03
6	G	1.093971E-02	1.252870E-02	1.779542E-01	-1.216483E-01	3.194367E-01	-2.476209E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.123487E-02	2.392776E-02	4.570861E-01	-1.709213E-01	-5.314126E-02	2.272819E-02
9	G	1.441984E-02	2.897364E-02	4.410155E-01	-1.307854E-01	5.079908E-02	1.298751E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 150 DEG
LOAD STEP = 9.00000E+00

SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.131779E-03	1.250324E-06	4.284225E-01	1.892518E-04	1.123038E-01	-5.940598E-08
2	G	1.403951E-02	2.954604E-02	5.034468E-01	-2.416939E-01	-2.795664E-02	1.937961E-02
3	G	1.810377E-02	3.550302E-02	5.001423E-01	-1.820944E-01	3.685236E-02	2.935308E-03
4	G	2.096860E-02	3.300125E-02	4.393209E-01	-1.391602E-01	1.490203E-01	-1.141041E-02
5	G	1.883020E-02	2.491806E-02	3.314177E-01	-8.133333E-02	1.337073E-01	-9.127391E-03
6	G	1.197113E-02	1.371396E-02	1.860746E-01	-1.280479E-01	3.334461E-01	-2.716306E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.225526E-02	2.614027E-02	4.776550E-01	-1.787006E-01	-5.540462E-02	2.483280E-02
9	G	1.573721E-02	3.166275E-02	4.608430E-01	-1.366231E-01	5.300594E-02	1.439887E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 150 DEG
LOAD STEP = 1.00000E+01

SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.846064E-03	1.468177E-06	4.456252E-01	2.277524E-04	1.259095E-01	1.424906E-06
2	G	1.515307E-02	3.195228E-02	5.233963E-01	-2.518938E-01	-2.892977E-02	2.093092E-02
3	G	1.955928E-02	3.840254E-02	5.199577E-01	-1.896821E-01	3.815131E-02	3.208932E-03
4	G	2.266539E-02	3.570307E-02	4.567364E-01	-1.449207E-01	1.550754E-01	-1.237321E-02
5	G	2.035687E-02	2.696190E-02	3.445473E-01	-8.409661E-02	1.388799E-01	-9.872780E-03
6	G	1.296120E-02	1.485213E-02	1.935399E-01	-1.339653E-01	3.462717E-01	-2.947513E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.322987E-02	2.825980E-02	4.965615E-01	-1.858215E-01	-5.742903E-02	2.684277E-02
9	G	1.699775E-02	3.424071E-02	4.790678E-01	-1.419557E-01	5.501014E-02	1.580653E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 150 DEG
LOAD STEP = 1.10000E+01

SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.052988E-02	1.695193E-06	4.616101E-01	2.684416E-04	1.389380E-01	3.327855E-06
2	G	1.622233E-02	3.426750E-02	5.418974E-01	-2.612973E-01	-2.979827E-02	2.242091E-02
3	G	2.095861E-02	4.119426E-02	5.383328E-01	-1.966893E-01	3.934472E-02	3.476672E-03
4	G	2.429836E-02	3.830611E-02	4.728889E-01	-1.502410E-01	1.606801E-01	-1.329958E-02
5	G	2.182733E-02	2.893204E-02	3.567286E-01	-8.666985E-02	1.436840E-01	-1.059178E-02
6	G	1.391596E-02	1.595011E-02	2.004674E-01	-1.394885E-01	3.581266E-01	-3.171164E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.416523E-02	3.029988E-02	5.141035E-01	-1.924023E-01	-5.925516E-02	2.877099E-02
9	G	1.820968E-02	3.672376E-02	4.959770E-01	-1.468741E-01	5.684813E-02	1.721327E-03

ONE TENTH, 200 DEG
LOAD STEP = 2.00000E+00

SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.358828E-03	7.355487E-08	2.154434E-01	4.684988E-06	-3.362801E-03	-5.761007E-07
2	G	3.632650E-03	7.307108E-03	2.534819E-01	-1.096795E-01	-1.524501E-02	5.110674E-03
3	G	4.611491E-03	8.789221E-03	2.517288E-01	-8.515172E-02	2.075714E-02	5.528591E-04
4	G	5.319860E-03	8.168803E-03	2.211388E-01	-6.504311E-02	7.178964E-02	-2.568360E-03
5	G	4.795018E-03	6.163848E-03	1.671271E-01	-4.686970E-02	7.020464E-02	-2.355721E-03
6	G	2.943332E-03	3.317913E-03	9.269178E-02	-5.541647E-02	1.689633E-01	-6.350109E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.141251E-03	6.551024E-03	2.413739E-01	-8.714139E-02	-2.693313E-02	6.114659E-03
9	G	4.044584E-03	7.924038E-03	2.330549E-01	-6.739330E-02	2.621151E-02	3.774358E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 200 DEG
LOAD STEP = 3.00000E+00

SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.716719E-03	1.888906E-07	2.705789E-01	1.821163E-05	1.497423E-02	-1.268621E-06
2	G	5.703422E-03	1.166910E-02	3.186098E-01	-1.442316E-01	-1.834102E-02	7.899298E-03
3	G	7.275778E-03	1.401925E-02	3.164505E-01	-1.102743E-01	2.484437E-02	9.992043E-04
4	G	8.399097E-03	1.302614E-02	2.779767E-01	-8.447200E-02	9.206965E-02	-4.270735E-03
5	G	7.553637E-03	9.828915E-03	2.099097E-01	-5.598703E-02	8.657819E-02	-3.675682E-03
6	G	4.700567E-03	5.337120E-03	1.169882E-01	-7.400262E-02	2.124067E-01	-1.034199E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.951420E-03	1.040448E-02	3.028885E-01	-1.112869E-01	-3.466473E-02	9.788832E-03
9	G	6.358653E-03	1.258226E-02	2.923686E-01	-8.572534E-02	3.345108E-02	5.584656E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 200 DEG
LOAD STEP = 4.00000E+00

SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.844261E-03	3.265192E-07	3.093947E-01	3.734945E-05	3.326790E-02	-1.825553E-06
2	G	7.427104E-03	1.532900E-02	3.643081E-01	-1.685910E-01	-2.070095E-02	1.023906E-02
3	G	9.504713E-03	1.840973E-02	3.618683E-01	-1.281048E-01	2.780457E-02	1.379467E-03
4	G	1.097943E-02	1.710287E-02	3.178566E-01	-9.812324E-02	1.062364E-01	-5.721403E-03
5	G	9.865088E-03	1.290421E-02	2.399226E-01	-6.226011E-02	9.816133E-02	-4.785878E-03
6	G	6.181776E-03	7.036840E-03	1.340392E-01	-8.713431E-02	2.426335E-01	-1.372599E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.461823E-03	1.362863E-02	3.460529E-01	-1.281249E-01	-3.999297E-02	1.287267E-02
9	G	8.291194E-03	1.648359E-02	3.339798E-01	-9.848730E-02	3.841891E-02	7.187132E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 200 DEG
LOAD STEP = 5.00000E+00

SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.841684E-03	4.862183E-07	3.403639E-01	6.127398E-05	5.075003E-02	-2.140217E-06
2	G	8.956624E-03	1.859299E-02	4.006624E-01	-1.879218E-01	-2.264834E-02	1.233374E-02
3	G	1.148873E-02	2.232796E-02	3.979982E-01	-1.423348E-01	3.020914E-02	1.720930E-03
4	G	1.327918E-02	2.074175E-02	3.495784E-01	-1.089258E-01	1.174549E-01	-7.022371E-03
5	G	1.192590E-02	1.564980E-02	2.637981E-01	-6.721988E-02	1.074341E-01	-5.780150E-03
6	G	7.506717E-03	8.557346E-03	1.476050E-01	-9.762285E-02	2.665181E-01	-1.676605E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.803173E-03	1.650081E-02	3.804033E-01	-1.414543E-01	-4.414062E-02	1.562166E-02
9	G	1.000997E-02	1.996228E-02	3.670896E-01	-1.085571E-01	4.229835E-02	8.705228E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 200 DEG
LOAD STEP = 6.00000E+00

SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.750870E-03	6.587941E-07	3.665591E-01	8.875101E-05	6.733190E-02	-2.159005E-06
2	G	1.035600E-02	2.158754E-02	4.313215E-01	-2.040451E-01	-2.428700E-02	1.426264E-02
3	G	1.330698E-02	2.592576E-02	4.284639E-01	-1.542211E-01	3.223641E-02	2.040091E-03
4	G	1.538942E-02	2.408561E-02	3.763352E-01	-1.179692E-01	1.268734E-01	-8.218135E-03
5	G	1.381833E-02	1.817404E-02	2.839442E-01	-7.140635E-02	1.152901E-01	-6.696200E-03
6	G	8.726306E-03	9.957343E-03	1.590535E-01	-1.065180E-01	2.865586E-01	-1.957565E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.029939E-03	1.913618E-02	4.093960E-01	-1.525989E-01	-4.758198E-02	1.814435E-02
9	G	1.158499E-02	2.315747E-02	3.950382E-01	-1.169731E-01	4.553472E-02	1.016804E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 200 DEG
LOAD STEP = 7.00000E+00

SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.594471E-03	8.444396E-07	3.894878E-01	1.194421E-04	8.306091E-02	-1.839073E-06
2	G	1.165878E-02	2.438316E-02	4.580899E-01	-2.180170E-01	-2.570211E-02	1.606681E-02
3	G	1.500260E-02	2.928716E-02	4.550608E-01	-1.645487E-01	3.400532E-02	2.342595E-03
4	G	1.735968E-02	2.721176E-02	3.996986E-01	-1.258189E-01	1.350674E-01	-9.335631E-03
5	G	1.558663E-02	2.053513E-02	3.015413E-01	-7.507224E-02	1.221735E-01	-7.554492E-03
6	G	9.868067E-03	1.126844E-02	1.690550E-01	-1.143297E-01	3.039752E-01	-2.221555E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.017169E-02	2.159669E-02	4.347242E-01	-1.622783E-01	-5.052045E-02	2.049632E-02
9	G	1.305360E-02	2.614329E-02	4.194542E-01	-1.242680E-01	4.832452E-02	1.160310E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 200 DEG
LOAD STEP = 8.00000E+00

SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.386467E-03	1.041769E-06	4.100151E-01	1.529866E-04	9.801036E-02	-1.151706E-06
2	G	1.288582E-02	2.702288E-02	4.819990E-01	-2.304098E-01	-2.694011E-02	1.777144E-02
3	G	1.660210E-02	3.246347E-02	4.788145E-01	-1.737308E-01	3.557900E-02	2.632805E-03
4	G	1.922034E-02	3.016770E-02	4.205683E-01	-1.327931E-01	1.423644E-01	-1.039136E-02
5	G	1.725796E-02	2.276884E-02	3.172656E-01	-7.835913E-02	1.283390E-01	-8.367544E-03
6	G	1.094897E-02	1.251009E-02	1.779936E-01	-1.213497E-01	3.194670E-01	-2.472340E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.124664E-02	2.392044E-02	4.573594E-01	-1.708851E-01	-5.308209E-02	2.271272E-02
9	G	1.443886E-02	2.896544E-02	4.412740E-01	-1.307411E-01	5.078568E-02	1.302265E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 200 DEG
LOAD STEP = 9.00000E+00

SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.136263E-03	1.249742E-06	4.286892E-01	1.891103E-04	1.122545E-01	-7.543910E-08
2	G	1.405115E-02	2.953558E-02	5.037022E-01	-2.415854E-01	-2.803286E-02	1.939344E-02
3	G	1.812327E-02	3.548915E-02	5.003747E-01	-1.820288E-01	3.699848E-02	2.913637E-03
4	G	2.099183E-02	3.298527E-02	4.395144E-01	-1.390933E-01	1.489712E-01	-1.139654E-02
5	G	1.885052E-02	2.489913E-02	3.315454E-01	-8.135502E-02	1.339484E-01	-9.143766E-03
6	G	1.198041E-02	1.369537E-02	1.861126E-01	-1.277617E-01	3.334759E-01	-2.712439E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.226706E-02	2.613301E-02	4.779169E-01	-1.786665E-01	-5.534826E-02	2.481738E-02
9	G	1.575626E-02	3.165462E-02	4.610908E-01	-1.365809E-01	5.299314E-02	1.443394E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 200 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.850577E-03	1.467542E-06	4.458818E-01	2.275975E-04	1.258613E-01	1.406285E-06
2	G	1.516475E-02	3.194189E-02	5.236424E-01	-2.517894E-01	-2.900360E-02	2.094495E-02
3	G	1.957882E-02	3.838874E-02	5.201817E-01	-1.896195E-01	3.829228E-02	3.187131E-03
4	G	2.268866E-02	3.568717E-02	4.569229E-01	-1.448560E-01	1.550279E-01	-1.235925E-02
5	G	2.037725E-02	2.694305E-02	3.446706E-01	-8.411893E-02	1.391118E-01	-9.889145E-03
6	G	1.297050E-02	1.483355E-02	1.935766E-01	-1.336898E-01	3.463010E-01	-2.943649E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.324170E-02	2.825260E-02	4.968138E-01	-1.857890E-01	-5.737512E-02	2.682741E-02
9	G	1.701683E-02	3.423264E-02	4.793065E-01	-1.419154E-01	5.499790E-02	1.584143E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 200 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.053442E-02	1.694507E-06	4.618582E-01	2.682737E-04	1.388909E-01	3.306567E-06
2	G	1.623403E-02	3.425718E-02	5.421355E-01	-2.611965E-01	-2.986997E-02	2.243511E-02
3	G	2.097819E-02	4.118055E-02	5.385495E-01	-1.966292E-01	3.948121E-02	3.454765E-03
4	G	2.432167E-02	3.829027E-02	4.730695E-01	-1.501782E-01	1.606341E-01	-1.328555E-02
5	G	2.184778E-02	2.891327E-02	3.568482E-01	-8.669259E-02	1.439081E-01	-1.060814E-02
6	G	1.392529E-02	1.593155E-02	2.005030E-01	-1.392221E-01	3.581556E-01	-3.167303E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.417708E-02	3.029274E-02	5.143476E-01	-1.923712E-01	-5.920339E-02	2.875570E-02
9	G	1.822879E-02	3.671575E-02	4.962078E-01	-1.468355E-01	5.683643E-02	1.724796E-03

ONE TENTH, 250 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.363033E-03	7.343962E-08	2.159703E-01	4.665842E-06	-3.403791E-03	-5.777393E-07
2	G	3.643904E-03	7.296593E-03	2.539834E-01	-1.095093E-01	-1.536469E-02	5.118910E-03
3	G	4.630649E-03	8.775120E-03	2.521832E-01	-8.501925E-02	2.101760E-02	5.348585E-04
4	G	5.342728E-03	8.152617E-03	2.215182E-01	-6.495472E-02	7.172048E-02	-2.558138E-03
5	G	4.814449E-03	6.144236E-03	1.673685E-01	-4.683664E-02	7.067232E-02	-2.372622E-03
6	G	2.952478E-03	3.299581E-03	9.276688E-02	-5.487816E-02	1.690079E-01	-6.314811E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.152844E-03	6.543413E-03	2.418869E-01	-8.707152E-02	-2.682437E-02	6.099723E-03
9	G	4.063388E-03	7.915500E-03	2.335400E-01	-6.731428E-02	2.619459E-02	3.801831E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 250 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.721013E-03	1.876693E-07	2.709981E-01	1.806309E-05	1.492617E-02	-1.268161E-06
2	G	5.714573E-03	1.165900E-02	3.190134E-01	-1.441215E-01	-1.845442E-02	7.909453E-03
3	G	7.295143E-03	1.400564E-02	3.168182E-01	-1.102137E-01	2.506831E-02	9.791233E-04
4	G	8.422216E-03	1.301008E-02	2.782815E-01	-8.439799E-02	9.200720E-02	-4.259521E-03
5	G	7.573499E-03	9.809544E-03	2.101060E-01	-5.598822E-02	8.695560E-02	-3.692281E-03
6	G	4.709831E-03	5.318651E-03	1.170481E-01	-7.356627E-02	2.124461E-01	-1.030420E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.963083E-03	1.039693E-02	3.032975E-01	-1.112528E-01	-3.456799E-02	9.772852E-03
9	G	6.377453E-03	1.257362E-02	2.927535E-01	-8.566884E-02	3.342805E-02	5.619347E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 250 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.848585E-03	3.294755E-07	3.097619E-01	3.753616E-05	3.321725E-02	-1.826345E-06
2	G	7.438387E-03	1.531869E-02	3.646605E-01	-1.684768E-01	-2.080315E-02	1.025057E-02
3	G	9.524080E-03	1.839592E-02	3.621891E-01	-1.280400E-01	2.800407E-02	1.358714E-03
4	G	1.100250E-02	1.708670E-02	3.181224E-01	-9.804715E-02	1.061767E-01	-5.709176E-03
5	G	9.884978E-03	1.288487E-02	2.400948E-01	-6.226915E-02	9.849365E-02	-4.802479E-03
6	G	6.190944E-03	7.018265E-03	1.340908E-01	-8.674479E-02	2.426680E-01	-1.368752E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.473503E-03	1.362111E-02	3.464116E-01	-1.280889E-01	-3.990861E-02	1.285669E-02
9	G	8.310039E-03	1.647504E-02	3.343178E-01	-9.843343E-02	3.839834E-02	7.223327E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 250 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.846040E-03	4.858726E-07	3.406981E-01	6.119399E-05	5.069811E-02	-2.146970E-06
2	G	8.968079E-03	1.858240E-02	4.009814E-01	-1.877940E-01	-2.274017E-02	1.234609E-02
3	G	1.150808E-02	2.231390E-02	3.982881E-01	-1.422546E-01	3.038908E-02	1.700149E-03
4	G	1.330224E-02	2.072557E-02	3.498198E-01	-1.088492E-01	1.173968E-01	-7.009384E-03
5	G	1.194591E-02	1.563056E-02	2.639557E-01	-6.723475E-02	1.077364E-01	-5.796646E-03
6	G	7.515911E-03	8.538748E-03	1.476520E-01	-9.726696E-02	2.665512E-01	-1.672753E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.814863E-03	1.649334E-02	3.807302E-01	-1.414118E-01	-4.406792E-02	1.560602E-02
9	G	1.002890E-02	1.995388E-02	3.673987E-01	-1.085044E-01	4.228185E-02	8.740405E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 250 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.755263E-03	6.583928E-07	3.668698E-01	8.865409E-05	6.728020E-02	-2.167857E-06
2	G	1.036750E-02	2.157700E-02	4.316184E-01	-2.039240E-01	-2.437386E-02	1.427552E-02
3	G	1.332638E-02	2.591176E-02	4.287338E-01	-1.541465E-01	3.240503E-02	2.018962E-03
4	G	1.541253E-02	2.406949E-02	3.765600E-01	-1.178957E-01	1.268180E-01	-8.204821E-03
5	G	1.383844E-02	1.815490E-02	2.840914E-01	-7.142432E-02	1.155715E-01	-6.712656E-03
6	G	8.735521E-03	9.938740E-03	1.590973E-01	-1.061860E-01	2.865905E-01	-1.953703E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.041660E-03	1.912876E-02	4.097003E-01	-1.525595E-01	-4.751458E-02	1.812871E-02
9	G	1.160395E-02	2.314915E-02	3.953259E-01	-1.169239E-01	4.551916E-02	1.020362E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 250 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.598898E-03	8.439784E-07	3.897805E-01	1.193295E-04	8.300985E-02	-1.850199E-06
2	G	1.167033E-02	2.437266E-02	4.583699E-01	-2.179014E-01	-2.578493E-02	1.608010E-02
3	G	1.502204E-02	2.927322E-02	4.553154E-01	-1.644784E-01	3.416507E-02	2.321215E-03
4	G	1.738283E-02	2.719570E-02	3.999106E-01	-1.257480E-01	1.350144E-01	-9.322083E-03
5	G	1.560682E-02	2.051608E-02	3.016806E-01	-7.509211E-02	1.224387E-01	-7.570918E-03
6	G	9.877303E-03	1.124984E-02	1.690963E-01	-1.140160E-01	3.040062E-01	-2.217690E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.018344E-02	2.158933E-02	4.350112E-01	-1.622413E-01	-5.045727E-02	2.048072E-02
9	G	1.307259E-02	2.613503E-02	4.197256E-01	-1.242217E-01	4.830984E-02	1.163878E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 250 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.390925E-03	1.041250E-06	4.102935E-01	1.528591E-04	9.796018E-02	-1.165229E-06
2	G	1.289742E-02	2.701242E-02	4.822655E-01	-2.302988E-01	-2.701958E-02	1.778504E-02
3	G	1.662157E-02	3.244960E-02	4.790569E-01	-1.736640E-01	3.573152E-02	2.611233E-03
4	G	1.924354E-02	3.015169E-02	4.207702E-01	-1.327246E-01	1.423133E-01	-1.037764E-02
5	G	1.727822E-02	2.274987E-02	3.173986E-01	-7.838023E-02	1.285912E-01	-8.383950E-03
6	G	1.095823E-02	1.249150E-02	1.780331E-01	-1.210509E-01	3.194973E-01	-2.468472E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.125842E-02	2.391315E-02	4.576326E-01	-1.708502E-01	-5.302238E-02	2.269718E-02
9	G	1.445788E-02	2.895726E-02	4.415324E-01	-1.306971E-01	5.077178E-02	1.305829E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 250 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.140751E-03	1.249168E-06	4.289558E-01	1.889687E-04	1.122053E-01	-9.146328E-08
2	G	1.406279E-02	2.952518E-02	5.039577E-01	-2.414786E-01	-2.810949E-02	1.940729E-02
3	G	1.814279E-02	3.547534E-02	5.006071E-01	-1.819649E-01	3.714494E-02	2.891913E-03
4	G	2.101507E-02	3.296933E-02	4.397080E-01	-1.390270E-01	1.489219E-01	-1.138269E-02
5	G	1.887085E-02	2.488024E-02	3.316731E-01	-8.137695E-02	1.341898E-01	-9.160158E-03
6	G	1.198969E-02	1.367679E-02	1.861505E-01	-1.274752E-01	3.335055E-01	-2.708571E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.227887E-02	2.612578E-02	4.781788E-01	-1.786332E-01	-5.529148E-02	2.480190E-02
9	G	1.577532E-02	3.164650E-02	4.613384E-01	-1.365391E-01	5.297995E-02	1.446943E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 250 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.855093E-03	1.466914E-06	4.461384E-01	2.274424E-04	1.258131E-01	1.387669E-06
2	G	1.517642E-02	3.193155E-02	5.238886E-01	-2.516862E-01	-2.907776E-02	2.095901E-02
3	G	1.959837E-02	3.837501E-02	5.204057E-01	-1.895582E-01	3.843356E-02	3.165283E-03
4	G	2.271195E-02	3.567130E-02	4.571095E-01	-1.447916E-01	1.549802E-01	-1.234530E-02
5	G	2.039765E-02	2.692423E-02	3.447939E-01	-8.414143E-02	1.393441E-01	-9.905529E-03
6	G	1.297980E-02	1.481498E-02	1.936132E-01	-1.334138E-01	3.463302E-01	-2.939781E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.325354E-02	2.824542E-02	4.970661E-01	-1.857572E-01	-5.732085E-02	2.681200E-02
9	G	1.703592E-02	3.422458E-02	4.795450E-01	-1.418754E-01	5.498534E-02	1.587671E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 250 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

DISPLACEMENT VECTOR

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.053896E-02	1.693826E-06	4.621062E-01	2.681058E-04	1.388438E-01	3.285279E-06
2	G	1.624574E-02	3.424689E-02	5.423737E-01	-2.610965E-01	-2.994197E-02	2.244934E-02
3	G	2.099777E-02	4.116688E-02	5.387663E-01	-1.965701E-01	3.961797E-02	3.432815E-03
4	G	2.434500E-02	3.827447E-02	4.732500E-01	-1.501155E-01	1.605879E-01	-1.327153E-02
5	G	2.186823E-02	2.889451E-02	3.569677E-01	-8.671547E-02	1.441324E-01	-1.062452E-02
6	G	1.393461E-02	1.591300E-02	2.005386E-01	-1.389552E-01	3.581844E-01	-3.163436E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.418895E-02	3.026561E-02	5.145916E-01	-1.923406E-01	-5.915133E-02	2.874036E-02
9	G	1.824790E-02	3.670775E-02	4.964386E-01	-1.467970E-01	5.682444E-02	1.728299E-03

ONE TENTH, 300 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.367231E-03	7.332545E-08	2.164965E-01	4.645270E-06	-3.444421E-03	-5.792397E-07
2	G	3.655146E-03	7.286183E-03	2.544847E-01	-1.093424E-01	-1.548555E-02	5.126880E-03
3	G	4.649807E-03	8.761142E-03	2.526376E-01	-8.489065E-02	2.127886E-02	5.170402E-04
4	G	5.365598E-03	8.136533E-03	2.218976E-01	-6.486823E-02	7.165094E-02	-2.548040E-03
5	G	4.833857E-03	6.124710E-03	1.676096E-01	-4.680381E-02	7.114077E-02	-2.389323E-03
6	G	2.961559E-03	3.281304E-03	9.284169E-02	-5.433842E-02	1.690515E-01	-6.277717E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.164432E-03	6.535877E-03	2.423992E-01	-8.700369E-02	-2.671536E-02	6.084937E-03
9	G	4.082184E-03	7.907037E-03	2.340243E-01	-6.723669E-02	2.617735E-02	3.829050E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 300 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.725439E-03	1.889507E-07	2.714158E-01	1.813912E-05	1.488237E-02	-1.273246E-06
2	G	5.725359E-03	1.165020E-02	3.194245E-01	-1.440907E-01	-1.857800E-02	7.918866E-03
3	G	7.314885E-03	1.399343E-02	3.171967E-01	-1.102358E-01	2.529720E-02	9.580322E-04
4	G	8.446011E-03	1.299481E-02	2.785947E-01	-8.435494E-02	9.194899E-02	-4.249698E-03
5	G	7.594205E-03	9.790799E-03	2.103101E-01	-5.600928E-02	8.733071E-02	-3.708508E-03
6	G	4.719755E-03	5.300478E-03	1.171133E-01	-7.315342E-02	2.124966E-01	-1.026866E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.974892E-03	1.038957E-02	3.037057E-01	-1.112604E-01	-3.446111E-02	9.755251E-03
9	G	6.396240E-03	1.256487E-02	2.931347E-01	-8.563216E-02	3.339537E-02	5.659220E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 300 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.852986E-03	3.283553E-07	3.101283E-01	3.739091E-05	3.316884E-02	-1.831720E-06
2	G	7.449308E-03	1.530956E-02	3.650196E-01	-1.684336E-01	-2.091648E-02	1.026163E-02
3	G	9.543752E-03	1.838334E-02	3.625188E-01	-1.280505E-01	2.821230E-02	1.336702E-03
4	G	1.102603E-02	1.707107E-02	3.183935E-01	-9.799135E-02	1.061213E-01	-5.698113E-03
5	G	9.905346E-03	1.286589E-02	2.402707E-01	-6.228699E-02	9.882587E-02	-4.818925E-03
6	G	6.200474E-03	6.999864E-03	1.341448E-01	-8.636558E-02	2.427074E-01	-1.365015E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.485301E-03	1.361371E-02	3.467694E-01	-1.280889E-01	-3.981226E-02	1.283924E-02
9	G	8.328821E-03	1.646632E-02	3.346521E-01	-9.839413E-02	3.836816E-02	7.265609E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 300 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.850434E-03	4.857433E-07	3.410318E-01	6.111067E-05	5.064701E-02	-2.152988E-06
2	G	8.979396E-03	1.857231E-02	4.013026E-01	-1.876912E-01	-2.283575E-02	1.235824E-02
3	G	1.152756E-02	2.230036E-02	3.985811E-01	-1.422006E-01	3.057159E-02	1.678923E-03
4	G	1.332551E-02	2.070965E-02	3.500633E-01	-1.087805E-01	1.173398E-01	-6.996883E-03
5	G	1.196615E-02	1.561151E-02	2.641148E-01	-6.725361E-02	1.080389E-01	-5.813071E-03
6	G	7.525272E-03	8.520246E-03	1.477000E-01	-9.691537E-02	2.665863E-01	-1.668954E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.826608E-03	1.648592E-02	3.810567E-01	-1.413818E-01	-4.399104E-02	1.558977E-02
9	G	1.004780E-02	1.994544E-02	3.677065E-01	-1.084568E-01	4.226176E-02	8.778234E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 300 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.759678E-03	6.579987E-07	3.671802E-01	8.855948E-05	6.722878E-02	-2.176700E-06
2	G	1.037893E-02	2.156675E-02	4.319165E-01	-2.038171E-01	-2.446296E-02	1.428832E-02
3	G	1.334585E-02	2.589808E-02	4.290054E-01	-1.540870E-01	3.257529E-02	1.997545E-03
4	G	1.543577E-02	2.405353E-02	3.767858E-01	-1.178264E-01	1.267631E-01	-8.191791E-03
5	G	1.385868E-02	1.813587E-02	2.842394E-01	-7.144435E-02	1.158531E-01	-6.729087E-03
6	G	8.744824E-03	9.920197E-03	1.591415E-01	-1.058557E-01	2.866232E-01	-1.949869E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.053417E-03	1.912139E-02	4.100043E-01	-1.525272E-01	-4.744458E-02	1.811268E-02
9	G	1.162290E-02	2.314080E-02	3.956128E-01	-1.168775E-01	4.550137E-02	1.024107E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 300 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.603341E-03	8.435464E-07	3.900730E-01	1.192166E-04	8.295889E-02	-1.861275E-06
2	G	1.168183E-02	2.436238E-02	4.586506E-01	-2.177948E-01	-2.586929E-02	1.609335E-02
3	G	1.504153E-02	2.925951E-02	4.555710E-01	-1.644178E-01	3.432596E-02	2.299629E-03
4	G	1.740608E-02	2.717976E-02	4.001232E-01	-1.256798E-01	1.349615E-01	-9.308717E-03
5	G	1.562710E-02	2.049710E-02	3.018203E-01	-7.511331E-02	1.227042E-01	-7.587337E-03
6	G	9.886597E-03	1.123128E-02	1.691380E-01	-1.137031E-01	3.040375E-01	-2.213838E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.019522E-02	2.158201E-02	4.352980E-01	-1.622089E-01	-5.039230E-02	2.046484E-02
9	G	1.309158E-02	2.612677E-02	4.199965E-01	-1.241771E-01	4.829361E-02	1.167591E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 300 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.395394E-03	1.040754E-06	4.105718E-01	1.527310E-04	9.791000E-02	-1.178735E-06
2	G	1.290898E-02	2.700212E-02	4.825325E-01	-2.301937E-01	-2.710015E-02	1.779864E-02
3	G	1.664109E-02	3.243589E-02	4.793001E-01	-1.736036E-01	3.588490E-02	2.589505E-03
4	G	1.926681E-02	3.013578E-02	4.209725E-01	-1.326578E-01	1.422623E-01	-1.036403E-02
5	G	1.729855E-02	2.273095E-02	3.175318E-01	-7.840219E-02	1.288438E-01	-8.400363E-03
6	G	1.096752E-02	1.247294E-02	1.780727E-01	-1.207521E-01	3.195276E-01	-2.464609E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.127022E-02	2.390589E-02	4.579057E-01	-1.708181E-01	-5.296138E-02	2.268143E-02
9	G	1.447691E-02	2.894907E-02	4.417904E-01	-1.306543E-01	5.075677E-02	1.309507E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 300 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.145248E-03	1.248612E-06	4.292223E-01	1.888263E-04	1.121561E-01	-1.074963E-07
2	G	1.407440E-02	2.951490E-02	5.042135E-01	-2.413757E-01	-2.818697E-02	1.942116E-02
3	G	1.816233E-02	3.546166E-02	5.008400E-01	-1.819055E-01	3.729211E-02	2.870061E-03
4	G	2.103836E-02	3.295346E-02	4.399018E-01	-1.389618E-01	1.488726E-01	-1.136891E-02
5	G	1.889123E-02	2.486138E-02	3.318010E-01	-8.139946E-02	1.344316E-01	-9.176566E-03
6	G	1.199899E-02	1.365823E-02	1.861885E-01	-1.271884E-01	3.335351E-01	-2.704701E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.229070E-02	2.611857E-02	4.784405E-01	-1.786019E-01	-5.523369E-02	2.478626E-02
9	G	1.579438E-02	3.163838E-02	4.615857E-01	-1.364979E-01	5.296589E-02	1.450590E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 300 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.859617E-03	1.466301E-06	4.463950E-01	2.272865E-04	1.257649E-01	1.369025E-06
2	G	1.518807E-02	3.192129E-02	5.241349E-01	-2.515858E-01	-2.915262E-02	2.097310E-02
3	G	1.961795E-02	3.836136E-02	5.206300E-01	-1.895001E-01	3.857545E-02	3.143323E-03
4	G	2.273527E-02	3.565548E-02	4.572962E-01	-1.447279E-01	1.549324E-01	-1.233139E-02
5	G	2.041808E-02	2.690544E-02	3.449173E-01	-8.416432E-02	1.395768E-01	-9.921934E-03
6	G	1.298912E-02	1.479644E-02	1.936498E-01	-1.331372E-01	3.463593E-01	-2.935907E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.326539E-02	2.823826E-02	4.973182E-01	-1.857268E-01	-5.726577E-02	2.679646E-02
9	G	1.705501E-02	3.421653E-02	4.797833E-01	-1.418357E-01	5.497207E-02	1.591287E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 300 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.054351E-02	1.693159E-06	4.623542E-01	2.679370E-04	1.387966E-01	3.263949E-06
2	G	1.625744E-02	3.423667E-02	5.426119E-01	-2.609986E-01	-3.001457E-02	2.246363E-02
3	G	2.101739E-02	4.115329E-02	5.389833E-01	-1.965135E-01	3.975530E-02	3.410762E-03
4	G	2.436835E-02	3.825870E-02	4.734306E-01	-1.500534E-01	1.605414E-01	-1.325752E-02
5	G	2.188871E-02	2.887578E-02	3.570872E-01	-8.673865E-02	1.443572E-01	-1.064092E-02
6	G	1.394394E-02	1.589447E-02	2.005741E-01	-1.386875E-01	3.582129E-01	-3.159559E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.420082E-02	3.027851E-02	5.148355E-01	-1.923111E-01	-5.909856E-02	2.872492E-02
9	G	1.826702E-02	3.669976E-02	4.966691E-01	-1.467588E-01	5.681183E-02	1.731883E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 350 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.371495E-03	7.320489E-08	2.170217E-01	4.630460E-06	-3.476444E-03	-5.806948E-07
2	G	3.666557E-03	7.275717E-03	2.549841E-01	-1.091455E-01	-1.559989E-02	5.135071E-03
3	G	4.668949E-03	8.747096E-03	2.530893E-01	-8.472092E-02	2.153227E-02	4.999061E-04
4	G	5.388543E-03	8.120810E-03	2.222783E-01	-6.478049E-02	7.157630E-02	-2.537698E-03
5	G	4.853522E-03	6.105624E-03	1.678543E-01	-4.678436E-02	7.160768E-02	-2.406012E-03
6	G	2.970786E-03	3.263273E-03	9.291868E-02	-5.381036E-02	1.691005E-01	-6.241180E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.176010E-03	6.528637E-03	2.429127E-01	-8.692455E-02	-2.661762E-02	6.071128E-03
9	G	4.101096E-03	7.899066E-03	2.345122E-01	-6.715883E-02	2.616498E-02	3.852794E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 350 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.729725E-03	1.887200E-07	2.718346E-01	1.808593E-05	1.482835E-02	-1.275194E-06
2	G	5.736610E-03	1.164003E-02	3.198259E-01	-1.439630E-01	-1.868842E-02	7.928989E-03
3	G	7.334214E-03	1.397976E-02	3.175620E-01	-1.101564E-01	2.551834E-02	9.383397E-04
4	G	8.469090E-03	1.297885E-02	2.788986E-01	-8.427811E-02	9.188408E-02	-4.238381E-03
5	G	7.614023E-03	9.771534E-03	2.105061E-01	-5.601090E-02	8.770895E-02	-3.725113E-03
6	G	4.728916E-03	5.282075E-03	1.171728E-01	-7.271501E-02	2.125353E-01	-1.023089E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.986551E-03	1.038213E-02	3.041144E-01	-1.112177E-01	-3.436704E-02	9.739504E-03
9	G	6.415078E-03	1.255643E-02	2.935203E-01	-8.557276E-02	3.337402E-02	5.693221E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 350 DEG SUBCASE 30
LOAD STEP = 4.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.857322E-03	3.278347E-07	3.104949E-01	3.733337E-05	3.311871E-02	-1.837423E-06
2	G	7.460625E-03	1.529932E-02	3.653711E-01	-1.683142E-01	-2.101783E-02	1.027318E-02
3	G	9.563133E-03	1.836963E-02	3.628388E-01	-1.279804E-01	2.840982E-02	1.316117E-03
4	G	1.104917E-02	1.705508E-02	3.186597E-01	-9.791681E-02	1.060603E-01	-5.685914E-03
5	G	9.925346E-03	1.284671E-02	2.404437E-01	-6.229918E-02	9.915807E-02	-4.835480E-03
6	G	6.209685E-03	6.981382E-03	1.341969E-01	-8.597846E-02	2.427431E-01	-1.361213E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.496992E-03	1.360627E-02	3.471277E-01	-1.280508E-01	-3.972953E-02	1.282332E-02
9	G	8.347698E-03	1.645789E-02	3.349902E-01	-9.834041E-02	3.834802E-02	7.301614E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 350 DEG SUBCASE 40
LOAD STEP = 5.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.854804E-03	4.852837E-07	3.413655E-01	6.103665E-05	5.059585E-02	-2.160220E-06
2	G	8.990797E-03	1.856199E-02	4.016224E-01	-1.875743E-01	-2.292969E-02	1.237059E-02
3	G	1.154697E-02	2.228660E-02	3.988722E-01	-1.421323E-01	3.075313E-02	1.657910E-03
4	G	1.334866E-02	2.069364E-02	3.503054E-01	-1.087073E-01	1.172818E-01	-6.984108E-03
5	G	1.198623E-02	1.559240E-02	2.642729E-01	-6.727016E-02	1.083418E-01	-5.829583E-03
6	G	7.534479E-03	8.501718E-03	1.477472E-01	-9.656009E-02	2.666197E-01	-1.665123E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.838324E-03	1.647852E-02	3.813833E-01	-1.413450E-01	-4.391624E-02	1.557388E-02
9	G	1.006672E-02	1.993708E-02	3.680149E-01	-1.084064E-01	4.224337E-02	8.814840E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 350 DEG SUBCASE 50
LOAD STEP = 6.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.764079E-03	6.576447E-07	3.674905E-01	8.846173E-05	6.717764E-02	-2.185476E-06
2	G	1.039041E-02	2.155637E-02	4.322136E-01	-2.037011E-01	-2.455098E-02	1.430125E-02
3	G	1.336528E-02	2.588426E-02	4.292757E-01	-1.540181E-01	3.274478E-02	1.976296E-03
4	G	1.545893E-02	2.403752E-02	3.770108E-01	-1.177546E-01	1.267076E-01	-8.178585E-03
5	G	1.387882E-02	1.811682E-02	2.843868E-01	-7.146326E-02	1.161350E-01	-6.745568E-03
6	G	8.754029E-03	9.901644E-03	1.591853E-01	-1.055235E-01	2.866550E-01	-1.946019E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.065155E-03	1.911404E-02	4.103083E-01	-1.524906E-01	-4.737612E-02	1.809693E-02
9	G	1.164186E-02	2.313253E-02	3.959001E-01	-1.168294E-01	4.548479E-02	1.027749E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 350 DEG SUBCASE 60
LOAD STEP = 7.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.607771E-03	8.430965E-07	3.903655E-01	1.191050E-04	8.290831E-02	-1.872445E-06
2	G	1.169337E-02	2.435198E-02	4.589307E-01	-2.176818E-01	-2.595287E-02	1.610669E-02
3	G	1.506099E-02	2.924569E-02	4.558258E-01	-1.643505E-01	3.448630E-02	2.278172E-03
4	G	1.742926E-02	2.716378E-02	4.003354E-01	-1.256098E-01	1.349082E-01	-9.295225E-03
5	G	1.564730E-02	2.047811E-02	3.019596E-01	-7.513366E-02	1.229699E-01	-7.603799E-03
6	G	9.895806E-03	1.121272E-02	1.691793E-01	-1.133889E-01	3.040682E-01	-2.209977E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.020698E-02	2.157471E-02	4.355848E-01	-1.621734E-01	-5.032849E-02	2.044918E-02
9	G	1.311058E-02	2.611857E-02	4.202676E-01	-1.241314E-01	4.827828E-02	1.171218E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 350 DEG SUBCASE 70
LOAD STEP = 8.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.399854E-03	1.040245E-06	4.108500E-01	1.526046E-04	9.786027E-02	-1.192336E-06
2	G	1.292057E-02	2.699176E-02	4.827991E-01	-2.300845E-01	-2.718023E-02	1.781230E-02
3	G	1.666059E-02	3.242211E-02	4.795426E-01	-1.735389E-01	3.603790E-02	2.567872E-03
4	G	1.929003E-02	3.011985E-02	4.211745E-01	-1.325899E-01	1.422110E-01	-1.035035E-02
5	G	1.731882E-02	2.271203E-02	3.176647E-01	-7.842363E-02	1.290964E-01	-8.416805E-03
6	G	1.097675E-02	1.245438E-02	1.781121E-01	-1.204526E-01	3.195576E-01	-2.460743E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.128201E-02	2.389864E-02	4.581787E-01	-1.707841E-01	-5.290119E-02	2.266585E-02
9	G	1.449594E-02	2.894093E-02	4.420485E-01	-1.306107E-01	5.074237E-02	1.313120E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 350 DEG SUBCASE 80
LOAD STEP = 9.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.149737E-03	1.248046E-06	4.294887E-01	1.886860E-04	1.121073E-01	-1.236320E-07
2	G	1.408604E-02	2.950457E-02	5.044689E-01	-2.412701E-01	-2.826409E-02	1.943508E-02
3	G	1.818186E-02	3.544793E-02	5.010725E-01	-1.818432E-01	3.743899E-02	2.848284E-03
4	G	2.106162E-02	3.293759E-02	4.400954E-01	-1.388958E-01	1.488231E-01	-1.135508E-02
5	G	1.891157E-02	2.484253E-02	3.319287E-01	-8.142164E-02	1.346735E-01	-9.192995E-03
6	G	1.200824E-02	1.363968E-02	1.862263E-01	-1.269012E-01	3.335645E-01	-2.700833E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.230252E-02	2.611138E-02	4.787022E-01	-1.785693E-01	-5.517653E-02	2.477075E-02
9	G	1.581343E-02	3.163031E-02	4.618331E-01	-1.364563E-01	5.295229E-02	1.454182E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 350 DEG
LOAD STEP = 1.00000E+01

SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.864134E-03	1.465681E-06	4.466515E-01	2.271329E-04	1.257172E-01	1.350265E-06
2	G	1.519975E-02	3.191101E-02	5.243810E-01	-2.514834E-01	-2.922722E-02	2.098723E-02
3	G	1.963751E-02	3.834770E-02	5.208541E-01	-1.894400E-01	3.871709E-02	3.121427E-03
4	G	2.275857E-02	3.563965E-02	4.574828E-01	-1.446638E-01	1.548845E-01	-1.231746E-02
5	G	2.043847E-02	2.688665E-02	3.450406E-01	-8.418700E-02	1.398095E-01	-9.938353E-03
6	G	1.299839E-02	1.477790E-02	1.936864E-01	-1.328605E-01	3.463882E-01	-2.932038E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.327723E-02	2.823112E-02	4.975703E-01	-1.856954E-01	-5.721118E-02	2.678104E-02
9	G	1.707410E-02	3.420852E-02	4.800217E-01	-1.417958E-01	5.495916E-02	1.594854E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 350 DEG
LOAD STEP = 1.10000E+01

SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.054806E-02	1.692485E-06	4.626021E-01	2.677707E-04	1.387500E-01	3.242490E-06
2	G	1.626915E-02	3.422644E-02	5.428500E-01	-2.608993E-01	-3.008695E-02	2.247793E-02
3	G	2.103698E-02	4.113968E-02	5.392001E-01	-1.964553E-01	3.989239E-02	3.388768E-03
4	G	2.439168E-02	3.824294E-02	4.736111E-01	-1.499910E-01	1.604950E-01	-1.324351E-02
5	G	2.190916E-02	2.885706E-02	3.572066E-01	-8.676167E-02	1.445820E-01	-1.065734E-02
6	G	1.395323E-02	1.587594E-02	2.006095E-01	-1.384199E-01	3.582415E-01	-3.155690E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.421269E-02	3.027142E-02	5.150793E-01	-1.922809E-01	-5.904621E-02	2.870956E-02
9	G	1.828614E-02	3.669181E-02	4.968997E-01	-1.467205E-01	5.679954E-02	1.735423E-03

ONE TENTH, 400 DEG
LOAD STEP = 2.00000E+00

SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.375595E-03	7.316699E-08	2.175462E-01	4.605499E-06	-3.526167E-03	-5.823217E-07
2	G	3.676803E-03	7.267762E-03	2.555033E-01	-1.091997E-01	-1.576805E-02	5.143355E-03
3	G	4.688556E-03	8.735888E-03	2.535690E-01	-8.486806E-02	2.183642E-02	4.777535E-04
4	G	5.411728E-03	8.105053E-03	2.226620E-01	-6.474157E-02	7.153090E-02	-2.530499E-03
5	G	4.872420E-03	6.085756E-03	1.680888E-01	-4.672921E-02	7.208692E-02	-2.423175E-03
6	G	2.979317E-03	3.244825E-03	9.298830E-02	-5.324136E-02	1.691299E-01	-6.203623E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.187724E-03	6.521059E-03	2.434190E-01	-8.696756E-02	-2.645250E-02	6.051285E-03
9	G	4.119399E-03	7.889617E-03	2.349769E-01	-6.711987E-02	2.611279E-02	3.898758E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 400 DEG
LOAD STEP = 3.00000E+00

SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.733935E-03	1.885501E-07	2.722536E-01	1.805493E-05	1.478611E-02	-1.279221E-06
2	G	5.748134E-03	1.162900E-02	3.202210E-01	-1.437745E-01	-1.879212E-02	7.940109E-03
3	G	7.353284E-03	1.396521E-02	3.179187E-01	-1.100140E-01	2.573429E-02	9.192888E-04
4	G	8.491748E-03	1.296247E-02	2.791967E-01	-8.418063E-02	9.181464E-02	-4.225964E-03
5	G	7.633354E-03	9.751987E-03	2.106973E-01	-5.600208E-02	8.808847E-02	-3.742016E-03
6	G	4.737653E-03	5.263553E-03	1.172291E-01	-7.226331E-02	2.125671E-01	-1.019221E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	4.998117E-03	1.037460E-02	3.045231E-01	-1.111432E-01	-3.428253E-02	9.724974E-03
9	G	6.433945E-03	1.254815E-02	2.939083E-01	-8.549895E-02	3.335973E-02	5.723552E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 400 DEG
LOAD STEP = 4.00000E+00

SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.861585E-03	3.278584E-07	3.108619E-01	3.726604E-05	3.306700E-02	-1.841065E-06
2	G	7.472223E-03	1.528826E-02	3.657176E-01	-1.681421E-01	-2.111217E-02	1.028525E-02
3	G	9.582272E-03	1.835506E-02	3.631519E-01	-1.278556E-01	2.860260E-02	1.296369E-03
4	G	1.107191E-02	1.703870E-02	3.189213E-01	-9.782568E-02	1.059956E-01	-5.672789E-03
5	G	9.944879E-03	1.282728E-02	2.406130E-01	-6.230319E-02	9.949146E-02	-4.852245E-03
6	G	6.218484E-03	6.962782E-03	1.342463E-01	-8.557986E-02	2.427735E-01	-1.357308E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.508590E-03	1.359880E-02	3.474863E-01	-1.279864E-01	-3.965485E-02	1.280859E-02
9	G	8.366616E-03	1.644967E-02	3.353307E-01	-9.827553E-02	3.833449E-02	7.333368E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 400 DEG
LOAD STEP = 5.00000E+00

SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.859133E-03	4.848964E-07	3.416995E-01	6.095717E-05	5.054416E-02	-2.167042E-06
2	G	9.002356E-03	1.855123E-02	4.019397E-01	-1.874304E-01	-2.302005E-02	1.238324E-02
3	G	1.156625E-02	2.227236E-02	3.991598E-01	-1.420357E-01	3.093221E-02	1.637372E-03
4	G	1.337159E-02	2.067743E-02	3.505453E-01	-1.086259E-01	1.172219E-01	-6.970818E-03
5	G	1.200605E-02	1.557316E-02	2.644292E-01	-6.728283E-02	1.086453E-01	-5.846215E-03
6	G	7.543447E-03	8.483130E-03	1.477931E-01	-9.619916E-02	2.666505E-01	-1.661240E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.849985E-03	1.647112E-02	3.817101E-01	-1.412949E-01	-4.384582E-02	1.555870E-02
9	G	1.008567E-02	1.992885E-02	3.683245E-01	-1.083505E-01	4.222854E-02	8.848775E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 400 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.768455E-03	6.572263E-07	3.678010E-01	8.836527E-05	6.712630E-02	-2.194291E-06
2	G	1.040198E-02	2.154575E-02	4.325095E-01	-2.035712E-01	-2.463720E-02	1.431434E-02
3	G	1.338463E-02	2.587019E-02	4.295443E-01	-1.539348E-01	3.291308E-02	1.955305E-03
4	G	1.548196E-02	2.402142E-02	3.772346E-01	-1.176785E-01	1.266510E-01	-8.165105E-03
5	G	1.389881E-02	1.809770E-02	2.845333E-01	-7.148017E-02	1.164171E-01	-6.762124E-03
6	G	8.763085E-03	9.883063E-03	1.592285E-01	-1.051883E-01	2.866855E-01	-1.942143E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.076860E-03	1.910670E-02	4.106124E-01	-1.524473E-01	-4.730994E-02	1.808158E-02
9	G	1.166084E-02	2.312433E-02	3.961880E-01	-1.167787E-01	4.547007E-02	1.031235E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 400 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.612186E-03	8.426235E-07	3.906581E-01	1.189931E-04	8.285762E-02	-1.883469E-06
2	G	1.170497E-02	2.434145E-02	4.592100E-01	-2.175609E-01	-2.603541E-02	1.612013E-02
3	G	1.508040E-02	2.923174E-02	4.560797E-01	-1.642751E-01	3.464593E-02	2.256881E-03
4	G	1.745237E-02	2.714775E-02	4.005468E-01	-1.255375E-01	1.348544E-01	-9.281583E-03
5	G	1.566741E-02	2.045910E-02	3.020985E-01	-7.515299E-02	1.232357E-01	-7.620305E-03
6	G	9.904919E-03	1.119415E-02	1.692202E-01	-1.130732E-01	3.040983E-01	-2.206105E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.021872E-02	2.156743E-02	4.358717E-01	-1.621342E-01	-5.026603E-02	2.043379E-02
9	G	1.312958E-02	2.611042E-02	4.205391E-01	-1.240842E-01	4.826406E-02	1.174741E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 400 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.404304E-03	1.039718E-06	4.111282E-01	1.524780E-04	9.781041E-02	-1.205694E-06
2	G	1.293220E-02	2.698131E-02	4.830652E-01	-2.299702E-01	-2.725959E-02	1.782601E-02
3	G	1.668005E-02	3.240825E-02	4.797845E-01	-1.734689E-01	3.619039E-02	2.546361E-03
4	G	1.931319E-02	3.010390E-02	4.213760E-01	-1.325206E-01	1.421595E-01	-1.033658E-02
5	G	1.733903E-02	2.269310E-02	3.177974E-01	-7.844444E-02	1.293490E-01	-8.433278E-03
6	G	1.098591E-02	1.243582E-02	1.781513E-01	-1.201524E-01	3.195872E-01	-2.456874E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.129379E-02	2.389141E-02	4.584518E-01	-1.707478E-01	-5.284194E-02	2.265045E-02
9	G	1.451497E-02	2.893284E-02	4.423069E-01	-1.305663E-01	5.072873E-02	1.316653E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 400 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.154217E-03	1.247467E-06	4.297552E-01	1.885452E-04	1.120584E-01	-1.394339E-07
2	G	1.409769E-02	2.949419E-02	5.047241E-01	-2.411610E-01	-2.834068E-02	1.944901E-02
3	G	1.820136E-02	3.543415E-02	5.013046E-01	-1.817772E-01	3.758544E-02	2.826607E-03
4	G	2.108484E-02	3.292170E-02	4.402887E-01	-1.388290E-01	1.487734E-01	-1.134121E-02
5	G	1.893185E-02	2.482368E-02	3.320562E-01	-8.144341E-02	1.349152E-01	-9.209444E-03
6	G	1.201743E-02	1.362113E-02	1.862641E-01	-1.266137E-01	3.335938E-01	-2.696968E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.231432E-02	2.610420E-02	4.789639E-01	-1.785352E-01	-5.512005E-02	2.475539E-02
9	G	1.583249E-02	3.162227E-02	4.620808E-01	-1.364142E-01	5.293924E-02	1.457708E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 400 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.868643E-03	1.465050E-06	4.469080E-01	2.269785E-04	1.256693E-01	1.331924E-06
2	G	1.521143E-02	3.190069E-02	5.246270E-01	-2.513787E-01	-2.930137E-02	2.100135E-02
3	G	1.965705E-02	3.833400E-02	5.210778E-01	-1.893772E-01	3.885837E-02	3.099621E-03
4	G	2.278183E-02	3.562384E-02	4.576691E-01	-1.445992E-01	1.548366E-01	-1.230351E-02
5	G	2.045882E-02	2.686787E-02	3.451637E-01	-8.420940E-02	1.400420E-01	-9.954786E-03
6	G	1.300761E-02	1.475936E-02	1.937229E-01	-1.325838E-01	3.464170E-01	-2.928176E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.328906E-02	2.822400E-02	4.978225E-01	-1.856630E-01	-5.715714E-02	2.676572E-02
9	G	1.709319E-02	3.420053E-02	4.802602E-01	-1.417556E-01	5.494669E-02	1.598363E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 400 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.055259E-02	1.691803E-06	4.628499E-01	2.676033E-04	1.387030E-01	3.221526E-06
2	G	1.628086E-02	3.421618E-02	5.430880E-01	-2.607983E-01	-3.015894E-02	2.249220E-02
3	G	2.105656E-02	4.112605E-02	5.394167E-01	-1.963952E-01	4.002913E-02	3.366856E-03
4	G	2.441499E-02	3.822718E-02	4.737915E-01	-1.499283E-01	1.604486E-01	-1.322949E-02
5	G	2.192957E-02	2.883835E-02	3.573260E-01	-8.678450E-02	1.448065E-01	-1.067376E-02
6	G	1.396248E-02	1.585742E-02	2.006450E-01	-1.381525E-01	3.582700E-01	-3.151833E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.422455E-02	3.026435E-02	5.153232E-01	-1.922499E-01	-5.899432E-02	2.869431E-02
9	G	1.830526E-02	3.668388E-02	4.971303E-01	-1.466819E-01	5.678761E-02	1.738909E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 450 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.379892E-03	7.3[illegible]1164E-08	2.180728E-01	4.583238E-06	-3.564603E-03	-5.839285E-07
2	G	3.688897E-03	7.255931E-03	2.559908E-01	-1.088630E-01	-1.585575E-02	5.151126E-03
3	G	4.707457E-03	8.720363E-03	2.540043E-01	-8.452626E-02	2.206690E-02	4.638024E-04
4	G	5.434502E-03	8.089309E-03	2.230393E-01	-6.462518E-02	7.143810E-02	-2.517711E-03
5	G	4.892296E-03	6.066959E-03	1.683361E-01	-4.672045E-02	7.255284E-02	-2.439747E-03
6	G	2.988612E-03	3.226925E-03	9.306674E-02	-5.271930E-02	1.691831E-01	-6.167647E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.199272E-03	6.513967E-03	2.439357E-01	-8.681699E-02	-2.638813E-02	6.041190E-03
9	G	4.138685E-03	7.882405E-03	2.354764E-01	-6.701649E-02	2.612170E-02	3.912791E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 450 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.738055E-03	1.882692E-07	2.726732E-01	1.801215E-05	1.473438E-02	-1.282869E-06
2	G	5.760032E-03	1.161694E-02	3.206082E-01	-1.435075E-01	-1.888414E-02	7.951583E-03
3	G	7.372047E-03	1.394958E-02	3.182650E-01	-1.097892E-01	2.594177E-02	9.015515E-04
4	G	8.513919E-03	1.294565E-02	2.794884E-01	-8.405951E-02	9.173942E-02	-4.212505E-03
5	G	7.652112E-03	9.732138E-03	2.108834E-01	-5.598137E-02	8.846994E-02	-3.759125E-03
6	G	4.745886E-03	5.244903E-03	1.172817E-01	-7.179528E-02	2.125914E-01	-1.015221E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	5.009577E-03	1.036703E-02	3.049321E-01	-1.110283E-01	-3.420929E-02	9.711836E-03
9	G	6.452877E-03	1.254015E-02	2.943000E-01	-8.540792E-02	3.335472E-02	5.749034E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 450 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.865836E-03	3.277619E-07	3.112286E-01	3.724157E-05	3.301457E-02	-1.846221E-06
2	G	7.484106E-03	1.527649E-02	3.660582E-01	-1.679138E-01	-2.119611E-02	1.029740E-02
3	G	9.601242E-03	1.833982E-02	3.634581E-01	-1.276698E-01	2.878427E-02	1.277917E-03
4	G	1.109451E-02	1.702225E-02	3.191809E-01	-9.772547E-02	1.059258E-01	-5.659017E-03
5	G	9.964416E-03	1.280789E-02	2.407822E-01	-6.230897E-02	9.982358E-02	-4.868921E-03
6	G	6.227275E-03	6.944221E-03	1.342958E-01	-8.518291E-02	2.428046E-01	-1.353437E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.520138E-03	1.359133E-02	3.478452E-01	-1.278943E-01	-3.959193E-02	1.279484E-02
9	G	8.385642E-03	1.644170E-02	3.356743E-01	-9.820157E-02	3.832860E-02	7.360468E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 450 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.863461E-03	4.845360E-07	3.420333E-01	6.087674E-05	5.049273E-02	-2.173812E-06
2	G	9.013922E-03	1.854048E-02	4.022568E-01	-1.872858E-01	-2.311064E-02	1.239595E-02
3	G	1.158552E-02	2.225816E-02	3.994472E-01	-1.419387E-01	3.111153E-02	1.616829E-03
4	G	1.339451E-02	2.066126E-02	3.507850E-01	-1.085443E-01	1.171616E-01	-6.957519E-03
5	G	1.202585E-02	1.555394E-02	2.645853E-01	-6.729543E-02	1.089492E-01	-5.862878E-03
6	G	7.552375E-03	8.464560E-03	1.478389E-01	-9.583732E-02	2.666810E-01	-1.657355E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.861647E-03	1.646375E-02	3.820367E-01	-1.412446E-01	-4.377534E-02	1.554354E-02
9	G	1.010461E-02	1.992066E-02	3.686340E-01	-1.082946E-01	4.221359E-02	8.882809E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 450 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.772830E-03	6.568052E-07	3.681113E-01	8.826962E-05	6.707528E-02	-2.203164E-06
2	G	1.041356E-02	2.153515E-02	4.328052E-01	-2.034410E-01	-2.472361E-02	1.432748E-02
3	G	1.340398E-02	2.585615E-02	4.298128E-01	-1.538513E-01	3.308154E-02	1.934310E-03
4	G	1.550500E-02	2.400534E-02	3.774584E-01	-1.176024E-01	1.265942E-01	-8.151620E-03
5	G	1.391879E-02	1.807861E-02	2.846797E-01	-7.149711E-02	1.166995E-01	-6.778704E-03
6	G	8.772109E-03	9.864498E-03	1.592715E-01	-1.048526E-01	2.867158E-01	-1.938267E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.088566E-03	1.909938E-02	4.109164E-01	-1.524039E-01	-4.724374E-02	1.806626E-02
9	G	1.167981E-02	2.311617E-02	3.964759E-01	-1.167280E-01	4.545525E-02	1.034728E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 450 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.616600E-03	8.421514E-07	3.909505E-01	1.188821E-04	8.280727E-02	-1.894563E-06
2	G	1.171657E-02	2.433095E-02	4.594893E-01	-2.174399E-01	-2.611815E-02	1.613361E-02
3	G	1.509981E-02	2.921781E-02	4.563334E-01	-1.641997E-01	3.480573E-02	2.235579E-03
4	G	1.747548E-02	2.713175E-02	4.007583E-01	-1.254652E-01	1.348003E-01	-9.267941E-03
5	G	1.568751E-02	2.044010E-02	3.022372E-01	-7.517235E-02	1.235017E-01	-7.636834E-03
6	G	9.914004E-03	1.117559E-02	1.692611E-01	-1.127570E-01	3.041281E-01	-2.202233E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.023046E-02	2.156017E-02	4.361585E-01	-1.620950E-01	-5.020352E-02	2.041841E-02
9	G	1.314859E-02	2.610230E-02	4.208105E-01	-1.240371E-01	4.824972E-02	1.178274E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 450 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.408753E-03	1.039193E-06	4.114064E-01	1.523524E-04	9.776089E-02	-1.219147E-06
2	G	1.294383E-02	2.697088E-02	4.833313E-01	-2.298559E-01	-2.733912E-02	1.783976E-02
3	G	1.669950E-02	3.239441E-02	4.800264E-01	-1.733990E-01	3.634302E-02	2.524841E-03
4	G	1.933636E-02	3.008797E-02	4.215775E-01	-1.324513E-01	1.421077E-01	-1.032281E-02
5	G	1.735922E-02	2.267419E-02	3.179300E-01	-7.846528E-02	1.296018E-01	-8.449771E-03
6	G	1.099504E-02	1.241727E-02	1.781904E-01	-1.198517E-01	3.196166E-01	-2.453006E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.130556E-02	2.388420E-02	4.587249E-01	-1.707115E-01	-5.278263E-02	2.263507E-02
9	G	1.453401E-02	2.892477E-02	4.425653E-01	-1.305220E-01	5.071499E-02	1.320195E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 450 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.158698E-03	1.246889E-06	4.300215E-01	1.884056E-04	1.120098E-01	-1.553577E-07
2	G	1.410935E-02	2.948383E-02	5.049792E-01	-2.410519E-01	-2.841743E-02	1.946298E-02
3	G	1.822086E-02	3.542040E-02	5.015367E-01	-1.817114E-01	3.773203E-02	2.804921E-03
4	G	2.110805E-02	3.290584E-02	4.404820E-01	-1.387622E-01	1.487237E-01	-1.132734E-02
5	G	1.895213E-02	2.480485E-02	3.321836E-01	-8.146521E-02	1.351571E-01	-9.225911E-03
6	G	1.202660E-02	1.360259E-02	1.863017E-01	-1.263258E-01	3.336228E-01	-2.693102E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.232612E-02	2.609704E-02	4.792256E-01	-1.785010E-01	-5.506353E-02	2.474004E-02
9	G	1.585156E-02	3.161426E-02	4.623283E-01	-1.363721E-01	5.292611E-02	1.461242E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 450 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.873153E-03	1.464421E-06	4.471644E-01	2.268256E-04	1.256217E-01	1.313434E-06
2	G	1.522312E-02	3.189040E-02	5.248728E-01	-2.512740E-01	-2.937567E-02	2.101550E-02
3	G	1.967659E-02	3.832032E-02	5.213016E-01	-1.893146E-01	3.899975E-02	3.077804E-03
4	G	2.280509E-02	3.560804E-02	4.578555E-01	-1.445345E-01	1.547885E-01	-1.228956E-02
5	G	2.047917E-02	2.684911E-02	3.452868E-01	-8.423185E-02	1.402746E-01	-9.971236E-03
6	G	1.301681E-02	1.474083E-02	1.937594E-01	-1.323068E-01	3.464457E-01	-2.924314E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.330090E-02	2.821689E-02	4.980745E-01	-1.856306E-01	-5.710305E-02	2.675042E-02
9	G	1.711227E-02	3.419258E-02	4.804986E-01	-1.417155E-01	5.493414E-02	1.601880E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 450 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.055713E-02	1.691123E-06	4.630978E-01	2.674374E-04	1.386564E-01	3.200387E-06
2	G	1.629258E-02	3.420595E-02	5.433258E-01	-2.606972E-01	-3.023108E-02	2.250651E-02
3	G	2.107613E-02	4.111245E-02	5.396332E-01	-1.963353E-01	4.016599E-02	3.344935E-03
4	G	2.443829E-02	3.821145E-02	4.739718E-01	-1.498655E-01	1.604020E-01	-1.321548E-02
5	G	2.194998E-02	2.881965E-02	3.574454E-01	-8.680738E-02	1.450311E-01	-1.069020E-02
6	G	1.397171E-02	1.583891E-02	2.006803E-01	-1.378848E-01	3.582984E-01	-3.147974E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.423641E-02	3.025729E-02	5.155671E-01	-1.922190E-01	-5.894239E-02	2.867907E-02
9	G	1.832437E-02	3.667597E-02	4.973609E-01	-1.466434E-01	5.677561E-02	1.742403E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 500 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.384068E-03	7.291216E-08	2.185965E-01	4.563408E-06	-3.603701E-03	-5.854652E-07
2	G	3.700022E-03	7.246244E-03	2.564931E-01	-1.087304E-01	-1.598692E-02	5.159469E-03
3	G	4.726688E-03	8.707223E-03	2.544610E-01	-8.444023E-02	2.233709E-02	4.453065E-04
4	G	5.457414E-03	8.073675E-03	2.234183E-01	-6.454662E-02	7.136847E-02	-2.508022E-03
5	G	4.911560E-03	6.047737E-03	1.685756E-01	-4.668676E-02	7.302584E-02	-2.456606E-03
6	G	2.997373E-03	3.208845E-03	9.313981E-02	-5.217080E-02	1.692224E-01	-6.130717E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.210887E-03	6.506738E-03	2.444452E-01	-8.676784E-02	-2.627027E-02	6.025924E-03
9	G	4.157424E-03	7.874170E-03	2.359560E-01	-6.694612E-02	2.609726E-02	3.943676E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 500 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.742372E-03	1.838797E-07	2.730900E-01	1.768127E-05	1.468790E-02	-1.282659E-06
2	G	5.771032E-03	1.160762E-02	3.210146E-01	-1.434421E-01	-1.900681E-02	7.961990E-03
3	G	7.391562E-03	1.393682E-02	3.186373E-01	-1.097774E-01	2.617310E-02	8.806915E-04
4	G	8.537259E-03	1.293012E-02	2.797957E-01	-8.400089E-02	9.167722E-02	-4.201985E-03
5	G	7.672146E-03	9.713178E-03	2.110816E-01	-5.599146E-02	8.884928E-02	-3.775878E-03
6	G	4.755110E-03	5.226652E-03	1.173425E-01	-7.136246E-02	2.126325E-01	-1.011580E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	5.021287E-03	1.035978E-02	3.053391E-01	-1.110195E-01	-3.410549E-02	9.695663E-03
9	G	6.471656E-03	1.253170E-02	2.946809E-01	-8.536322E-02	3.332527E-02	5.786013E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 500 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.870356E-03	3.094987E-07	3.116078E-01	3.588219E-05	3.296534E-02	-1.873760E-06
2	G	7.495740E-03	1.526705E-02	3.664253E-01	-1.678081E-01	-2.130093E-02	1.030973E-02
3	G	9.621022E-03	1.832704E-02	3.637935E-01	-1.276123E-01	2.898657E-02	1.257069E-03
4	G	1.111803E-02	1.700704E-02	3.194594E-01	-9.765361E-02	1.058692E-01	-5.647257E-03
5	G	9.984640E-03	1.278928E-02	2.409637E-01	-6.232030E-02	1.001616E-01	-4.885959E-03
6	G	6.236496E-03	6.926060E-03	1.343523E-01	-8.479369E-02	2.428477E-01	-1.349712E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.532104E-03	1.358457E-02	3.482174E-01	-1.278649E-01	-3.950857E-02	1.277970E-02
9	G	8.404856E-03	1.643408E-02	3.360254E-01	-9.815235E-02	3.830853E-02	7.396855E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 500 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.867814E-03	4.842311E-07	3.423668E-01	6.079773E-05	5.044195E-02	-2.180414E-06
2	G	9.025394E-03	1.853010E-02	4.025754E-01	-1.871589E-01	-2.320392E-02	1.240853E-02
3	G	1.160488E-02	2.224433E-02	3.997368E-01	-1.418603E-01	3.129270E-02	1.595970E-03
4	G	1.341758E-02	2.064528E-02	3.510262E-01	-1.084684E-01	1.171022E-01	-6.944564E-03
5	G	1.204582E-02	1.553487E-02	2.647425E-01	-6.731090E-02	1.092532E-01	-5.879495E-03
6	G	7.561414E-03	8.446063E-03	1.478853E-01	-9.547844E-02	2.667128E-01	-1.653509E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.873347E-03	1.645643E-02	3.823631E-01	-1.412032E-01	-4.370191E-02	1.552797E-02
9	G	1.012355E-02	1.991245E-02	3.689426E-01	-1.082423E-01	4.219606E-02	8.918732E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 500 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.777220E-03	6.564130E-07	3.684214E-01	8.817429E-05	6.702453E-02	-2.211964E-06
2	G	1.042508E-02	2.152477E-02	4.331018E-01	-2.033206E-01	-2.481162E-02	1.434056E-02
3	G	1.342339E-02	2.584235E-02	4.300824E-01	-1.537782E-01	3.325116E-02	1.913114E-03
4	G	1.552811E-02	2.398939E-02	3.776829E-01	-1.175294E-01	1.265378E-01	-8.138334E-03
5	G	1.393886E-02	1.805961E-02	2.848266E-01	-7.151553E-02	1.169822E-01	-6.795271E-03
6	G	8.781188E-03	9.845980E-03	1.593149E-01	-1.045180E-01	2.867466E-01	-1.934411E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.100297E-03	1.909211E-02	4.112203E-01	-1.523654E-01	-4.717573E-02	1.805067E-02
9	G	1.169878E-02	2.310801E-02	3.967631E-01	-1.166792E-01	4.543886E-02	1.038353E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 500 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.621024E-03	8.416990E-07	3.912428E-01	1.187711E-04	8.275703E-02	-1.905620E-06
2	G	1.172813E-02	2.432060E-02	4.597690E-01	-2.173248E-01	-2.620193E-02	1.614707E-02
3	G	1.511926E-02	2.920405E-02	4.565878E-01	-1.641306E-01	3.496630E-02	2.214141E-03
4	G	1.749864E-02	2.711585E-02	4.009701E-01	-1.253948E-01	1.347464E-01	-9.254420E-03
5	G	1.570767E-02	2.042117E-02	3.023763E-01	-7.519259E-02	1.237680E-01	-7.653364E-03
6	G	9.923120E-03	1.115706E-02	1.693021E-01	-1.124411E-01	3.041582E-01	-2.198371E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.024222E-02	2.155294E-02	4.364451E-01	-1.620588E-01	-5.013982E-02	2.040285E-02
9	G	1.316759E-02	2.609419E-02	4.210815E-01	-1.239911E-01	4.823434E-02	1.181902E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 500 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.413209E-03	1.038684E-06	4.116844E-01	1.522265E-04	9.771143E-02	-1.232584E-06
2	G	1.295543E-02	2.696056E-02	4.835976E-01	-2.297454E-01	-2.741941E-02	1.785351E-02
3	G	1.671899E-02	3.238070E-02	4.802687E-01	-1.733332E-01	3.649625E-02	2.503217E-03
4	G	1.935956E-02	3.007211E-02	4.217792E-01	-1.323832E-01	1.420559E-01	-1.030911E-02
5	G	1.737946E-02	2.265533E-02	3.180627E-01	-7.848670E-02	1.298550E-01	-8.466274E-03
6	G	1.100419E-02	1.239874E-02	1.782296E-01	-1.195510E-01	3.196461E-01	-2.449141E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.131735E-02	2.387702E-02	4.589977E-01	-1.706772E-01	-5.272247E-02	2.261956E-02
9	G	1.455304E-02	2.891672E-02	4.428233E-01	-1.304783E-01	5.070049E-02	1.323813E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 500 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.163183E-03	1.246324E-06	4.302878E-01	1.882657E-04	1.119613E-01	-1.712811E-07
2	G	1.412099E-02	2.947355E-02	5.052345E-01	-2.409455E-01	-2.849477E-02	1.947697E-02
3	G	1.824039E-02	3.540674E-02	5.017689E-01	-1.816484E-01	3.787911E-02	2.783149E-03
4	G	2.113130E-02	3.289003E-02	4.406754E-01	-1.386962E-01	1.486738E-01	-1.131351E-02
5	G	1.897243E-02	2.478605E-02	3.323112E-01	-8.148740E-02	1.353994E-01	-9.242395E-03
6	G	1.203578E-02	1.358407E-02	1.863394E-01	-1.260377E-01	3.336518E-01	-2.689236E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.233794E-02	2.608991E-02	4.794872E-01	-1.784683E-01	-5.500634E-02	2.472459E-02
9	G	1.587062E-02	3.160625E-02	4.625756E-01	-1.363304E-01	5.291238E-02	1.464842E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 500 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.877667E-03	1.463802E-06	4.474207E-01	2.266722E-04	1.255741E-01	1.294933E-06
2	G	1.523480E-02	3.188017E-02	5.251188E-01	-2.511711E-01	-2.945046E-02	2.102969E-02
3	G	1.969615E-02	3.830672E-02	5.215254E-01	-1.892541E-01	3.914158E-02	3.055913E-03
4	G	2.282838E-02	3.559228E-02	4.580419E-01	-1.444704E-01	1.547403E-01	-1.227564E-02
5	G	2.049954E-02	2.683038E-02	3.454100E-01	-8.425456E-02	1.405076E-01	-9.987705E-03
6	G	1.302602E-02	1.472232E-02	1.937958E-01	-1.320293E-01	3.464743E-01	-2.920448E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.331274E-02	2.820981E-02	4.983265E-01	-1.855993E-01	-5.704841E-02	2.673504E-02
9	G	1.713137E-02	3.418463E-02	4.807369E-01	-1.416756E-01	5.492110E-02	1.605456E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 500 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.056167E-02	1.690452E-06	4.633456E-01	2.672712E-04	1.386098E-01	3.179228E-06
2	G	1.630429E-02	3.419576E-02	5.435638E-01	-2.605976E-01	-3.030363E-02	2.252086E-02
3	G	2.109572E-02	4.109890E-02	5.398498E-01	-1.962769E-01	4.030324E-02	3.322945E-03
4	G	2.446162E-02	3.819575E-02	4.741523E-01	-1.498032E-01	1.603553E-01	-1.320148E-02
5	G	2.197041E-02	2.880098E-02	3.575647E-01	-8.683044E-02	1.452561E-01	-1.070666E-02
6	G	1.398094E-02	1.582041E-02	2.007157E-01	-1.376165E-01	3.583266E-01	-3.144109E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.424828E-02	3.025026E-02	5.158108E-01	-1.921888E-01	-5.888999E-02	2.866376E-02
9	G	1.834349E-02	3.666808E-02	4.975914E-01	-1.466051E-01	5.676319E-02	1.745951E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 550 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.388267E-03	7.280973E-08	2.191201E-01	4.543870E-06	-3.641889E-03	-5.870224E-07
2	G	3.711288E-03	7.236405E-03	2.569935E-01	-1.085724E-01	-1.611334E-02	5.167950E-03
3	G	4.745899E-03	8.693922E-03	2.549151E-01	-8.432275E-02	2.260252E-02	4.273271E-04
4	G	5.480345E-03	8.058178E-03	2.237973E-01	-6.446496E-02	7.129483E-02	-2.498030E-03
5	G	4.930925E-03	6.028696E-03	1.688163E-01	-4.665829E-02	7.349914E-02	-2.473447E-03
6	G	3.006154E-03	3.190859E-03	9.321354E-02	-5.162504E-02	1.692632E-01	-6.094227E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.222505E-03	6.499638E-03	2.449554E-01	-8.670709E-02	-2.615907E-02	6.011321E-03
9	G	4.176255E-03	7.866195E-03	2.364381E-01	-6.687260E-02	2.607632E-02	3.972538E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 550 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.746633E-03	1.836360E-07	2.735078E-01	1.763768E-05	1.464136E-02	-1.285664E-06
2	G	5.782385E-03	1.159740E-02	3.214133E-01	-1.432966E-01	-1.911722E-02	7.972746E-03
3	G	7.410825E-03	1.392315E-02	3.189994E-01	-1.096807E-01	2.639398E-02	8.611031E-04
4	G	8.560224E-03	1.291427E-02	2.800975E-01	-8.391875E-02	9.160904E-02	-4.190340E-03
5	G	7.691786E-03	9.694032E-03	2.112758E-01	-5.599122E-02	8.922979E-02	-3.792678E-03
6	G	4.763988E-03	5.208339E-03	1.174005E-01	-7.091705E-02	2.126676E-01	-1.007800E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	5.032929E-03	1.035249E-02	3.057469E-01	-1.109683E-01	-3.401383E-02	9.680378E-03
9	G	6.490520E-03	1.252352E-02	2.950664E-01	-8.530007E-02	3.330480E-02	5.819614E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 550 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.874426E-03	3.275399E-07	3.119546E-01	3.713303E-05	3.291753E-02	-1.855806E-06
2	G	7.506062E-03	1.525750E-02	3.667648E-01	-1.677881E-01	-2.142275E-02	1.032064E-02
3	G	9.640172E-03	1.831387E-02	3.641045E-01	-1.276549E-01	2.920357E-02	1.234053E-03
4	G	1.114087E-02	1.699055E-02	3.197110E-01	-9.759658E-02	1.058083E-01	-5.635855E-03
5	G	1.000419E-02	1.276958E-02	2.411235E-01	-6.233303E-02	1.004918E-01	-4.902317E-03
6	G	6.245314E-03	6.907277E-03	1.343965E-01	-8.439973E-02	2.428685E-01	-1.345797E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.543506E-03	1.357652E-02	3.485531E-01	-1.278752E-01	-3.940127E-02	1.276121E-02
9	G	8.423051E-03	1.642442E-02	3.363362E-01	-9.811316E-02	3.827032E-02	7.442383E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 550 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.872163E-03	4.838752E-07	3.427002E-01	6.071966E-05	5.039133E-02	-2.187198E-06
2	G	9.036882E-03	1.851971E-02	4.028937E-01	-1.870299E-01	-2.329717E-02	1.242118E-02
3	G	1.162423E-02	2.223050E-02	4.000260E-01	-1.417798E-01	3.147392E-02	1.575133E-03
4	G	1.344063E-02	2.062933E-02	3.512670E-01	-1.083917E-01	1.170423E-01	-6.931568E-03
5	G	1.206575E-02	1.551581E-02	2.648995E-01	-6.732607E-02	1.095575E-01	-5.896146E-03
6	G	7.570401E-03	8.427578E-03	1.479316E-01	-9.511843E-02	2.667442E-01	-1.649659E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.885045E-03	1.644914E-02	3.826893E-01	-1.411608E-01	-4.362869E-02	1.551246E-02
9	G	1.014249E-02	1.990429E-02	3.692511E-01	-1.081897E-01	4.217865E-02	8.954583E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 550 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.781608E-03	6.560183E-07	3.687315E-01	8.807931E-05	6.697395E-02	-2.220764E-06
2	G	1.043661E-02	2.151440E-02	4.333981E-01	-2.031991E-01	-2.489968E-02	1.435370E-02
3	G	1.344279E-02	2.582856E-02	4.303518E-01	-1.537039E-01	3.342085E-02	1.891930E-03
4	G	1.555122E-02	2.397347E-02	3.779072E-01	-1.174560E-01	1.264810E-01	-8.125029E-03
5	G	1.395890E-02	1.804062E-02	2.849734E-01	-7.153383E-02	1.172651E-01	-6.811866E-03
6	G	8.790229E-03	9.827474E-03	1.593581E-01	-1.041827E-01	2.867770E-01	-1.930553E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.112027E-03	1.908486E-02	4.115240E-01	-1.523264E-01	-4.710782E-02	1.803513E-02
9	G	1.171776E-02	2.309988E-02	3.970504E-01	-1.166302E-01	4.542249E-02	1.041974E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 550 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.625446E-03	8.412459E-07	3.915350E-01	1.186605E-04	8.270695E-02	-1.916667E-06
2	G	1.173971E-02	2.431026E-02	4.600486E-01	-2.172091E-01	-2.628579E-02	1.616058E-02
3	G	1.513871E-02	2.919030E-02	4.568420E-01	-1.640609E-01	3.512696E-02	2.192709E-03
4	G	1.752179E-02	2.709996E-02	4.011818E-01	-1.253241E-01	1.346922E-01	-9.240888E-03
5	G	1.572781E-02	2.040226E-02	3.025152E-01	-7.521278E-02	1.240344E-01	-7.669917E-03
6	G	9.932203E-03	1.113855E-02	1.693430E-01	-1.121248E-01	3.041880E-01	-2.194508E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.025398E-02	2.154573E-02	4.367316E-01	-1.620223E-01	-5.007617E-02	2.038733E-02
9	G	1.318660E-02	2.608611E-02	4.213524E-01	-1.239450E-01	4.821894E-02	1.185531E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 550 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.417662E-03	1.038174E-06	4.119624E-01	1.521011E-04	9.766211E-02	-1.246004E-06
2	G	1.296705E-02	2.695026E-02	4.838638E-01	-2.296345E-01	-2.749979E-02	1.786730E-02
3	G	1.673847E-02	3.236700E-02	4.805109E-01	-1.732671E-01	3.664955E-02	2.481595E-03
4	G	1.938277E-02	3.005627E-02	4.219809E-01	-1.323149E-01	1.420040E-01	-1.029541E-02
5	G	1.739968E-02	2.263649E-02	3.181954E-01	-7.850809E-02	1.301083E-01	-8.482797E-03
6	G	1.101330E-02	1.238023E-02	1.782687E-01	-1.192498E-01	3.196753E-01	-2.445276E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.132914E-02	2.386986E-02	4.592706E-01	-1.706427E-01	-5.266232E-02	2.260408E-02
9	G	1.457208E-02	2.890869E-02	4.430813E-01	-1.304346E-01	5.068596E-02	1.327433E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 550 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.167667E-03	1.245760E-06	4.305540E-01	1.881262E-04	1.119129E-01	-1.871817E-07
2	G	1.413264E-02	2.946329E-02	5.054896E-01	-2.408388E-01	-2.857219E-02	1.949099E-02
3	G	1.825991E-02	3.539310E-02	5.020012E-01	-1.815853E-01	3.802626E-02	2.761379E-03
4	G	2.115454E-02	3.287424E-02	4.408687E-01	-1.386301E-01	1.486237E-01	-1.129969E-02
5	G	1.899272E-02	2.476727E-02	3.324386E-01	-8.150960E-02	1.356417E-01	-9.258896E-03
6	G	1.204493E-02	1.356556E-02	1.863770E-01	-1.257491E-01	3.336806E-01	-2.685370E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.234975E-02	2.608280E-02	4.797486E-01	-1.784354E-01	-5.494915E-02	2.470917E-02
9	G	1.588969E-02	3.159827E-02	4.628229E-01	-1.362888E-01	5.289862E-02	1.468445E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 550 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.882179E-03	1.463183E-06	4.476770E-01	2.265193E-04	1.255266E-01	1.276459E-06
2	G	1.524648E-02	3.186995E-02	5.253647E-01	-2.510681E-01	-2.952533E-02	2.104390E-02
3	G	1.971570E-02	3.829313E-02	5.217493E-01	-1.891935E-01	3.928346E-02	3.034023E-03
4	G	2.285166E-02	3.557655E-02	4.582283E-01	-1.444063E-01	1.546919E-01	-1.226171E-02
5	G	2.051990E-02	2.681166E-02	3.455330E-01	-8.427729E-02	1.407407E-01	-1.000419E-02
6	G	1.303520E-02	1.470383E-02	1.938321E-01	-1.317515E-01	3.465028E-01	-2.916583E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.332458E-02	2.820274E-02	4.985785E-01	-1.855678E-01	-5.699378E-02	2.671967E-02
9	G	1.715046E-02	3.417670E-02	4.809751E-01	-1.416357E-01	5.490802E-02	1.609035E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 550 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.056621E-02	1.689781E-06	4.635933E-01	2.671055E-04	1.385634E-01	3.158102E-06
2	G	1.631601E-02	3.418560E-02	5.438017E-01	-2.604979E-01	-3.037626E-02	2.253524E-02
3	G	2.111532E-02	4.108538E-02	5.400664E-01	-1.962185E-01	4.044054E-02	3.300956E-03
4	G	2.448494E-02	3.818007E-02	4.743326E-01	-1.497408E-01	1.603085E-01	-1.318749E-02
5	G	2.199082E-02	2.878233E-02	3.576840E-01	-8.685353E-02	1.454813E-01	-1.072313E-02
6	G	1.399016E-02	1.580193E-02	2.007510E-01	-1.373480E-01	3.583548E-01	-3.140245E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.426015E-02	3.024324E-02	5.160545E-01	-1.921587E-01	-5.883757E-02	2.864846E-02
9	G	1.836261E-02	3.666021E-02	4.978218E-01	-1.465668E-01	5.675072E-02	1.749502E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 600 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.392462E-03	7.270886E-08	2.196432E-01	4.524498E-06	-3.679619E-03	-5.885798E-07
2	G	3.722555E-03	7.226671E-03	2.574936E-01	-1.084163E-01	-1.624089E-02	5.176541E-03
3	G	4.765115E-03	8.680749E-03	2.553691E-01	-8.420790E-02	2.286878E-02	4.092935E-04
4	G	5.503282E-03	8.042788E-03	2.241762E-01	-6.438421E-02	7.122042E-02	-2.488084E-03
5	G	4.950272E-03	6.009742E-03	1.690569E-01	-4.663039E-02	7.397334E-02	-2.490305E-03
6	G	3.014871E-03	3.172926E-03	9.328699E-02	-5.107787E-02	1.693034E-01	-6.057856E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.234125E-03	6.492615E-03	2.454651E-01	-8.664764E-02	-2.604723E-02	5.996721E-03
9	G	4.195088E-03	7.858305E-03	2.369195E-01	-6.679972E-02	2.605457E-02	4.001726E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 600 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.750894E-03	1.834546E-07	2.739254E-01	1.759831E-05	1.459519E-02	-1.288709E-06
2	G	5.793739E-03	1.158726E-02	3.218120E-01	-1.431524E-01	-1.922833E-02	7.983570E-03
3	G	7.430095E-03	1.390956E-02	3.193615E-01	-1.095857E-01	2.661547E-02	8.414756E-04
4	G	8.583194E-03	1.289849E-02	2.803992E-01	-8.383708E-02	9.154045E-02	-4.178716E-03
5	G	7.711416E-03	9.674943E-03	2.114699E-01	-5.599129E-02	8.961087E-02	-3.809504E-03
6	G	4.772824E-03	5.190060E-03	1.174583E-01	-7.047077E-02	2.127024E-01	-1.004026E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	5.044574E-03	1.034526E-02	3.061544E-01	-1.109180E-01	-3.392176E-02	9.665103E-03
9	G	6.509386E-03	1.251540E-02	2.954515E-01	-8.523735E-02	3.328384E-02	5.853473E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 600 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.878764E-03	3.256768E-07	3.123232E-01	3.691364E-05	3.286748E-02	-1.861148E-06
2	G	7.517801E-03	1.524669E-02	3.671125E-01	-1.676054E-01	-2.151464E-02	1.033274E-02
3	G	9.659419E-03	1.829967E-02	3.644191E-01	-1.275174E-01	2.939189E-02	1.214781E-03
4	G	1.116383E-02	1.697468E-02	3.199762E-01	-9.750944E-02	1.057416E-01	-5.622885E-03
5	G	1.002403E-02	1.275060E-02	2.412966E-01	-6.234387E-02	1.008259E-01	-4.919051E-03
6	G	6.254257E-03	6.888930E-03	1.344482E-01	-8.400685E-02	2.429032E-01	-1.342003E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.555189E-03	1.356934E-02	3.489141E-01	-1.278066E-01	-3.933070E-02	1.274671E-02
9	G	8.442115E-03	1.641659E-02	3.366800E-01	-9.804896E-02	3.825825E-02	7.473653E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 600 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.876515E-03	4.835413E-07	3.430334E-01	6.064158E-05	5.034099E-02	-2.193907E-06
2	G	9.048359E-03	1.850940E-02	4.032121E-01	-1.869034E-01	-2.339103E-02	1.243385E-02
3	G	1.164360E-02	2.221677E-02	4.003155E-01	-1.417021E-01	3.165558E-02	1.554242E-03
4	G	1.346370E-02	2.061343E-02	3.515081E-01	-1.083160E-01	1.169823E-01	-6.918628E-03
5	G	1.208569E-02	1.549680E-02	2.650566E-01	-6.734176E-02	1.098621E-01	-5.912810E-03
6	G	7.579378E-03	8.409121E-03	1.479779E-01	-9.475838E-02	2.667755E-01	-1.645817E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.896750E-03	1.644189E-02	3.830154E-01	-1.411198E-01	-4.355496E-02	1.549690E-02
9	G	1.016143E-02	1.989615E-02	3.695593E-01	-1.081376E-01	4.216071E-02	8.990810E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 600 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.785997E-03	6.556292E-07	3.690414E-01	8.798464E-05	6.692357E-02	-2.229545E-06
2	G	1.044814E-02	2.150409E-02	4.336945E-01	-2.030790E-01	-2.498815E-02	1.436687E-02
3	G	1.346220E-02	2.581484E-02	4.306213E-01	-1.536314E-01	3.359086E-02	1.870709E-03
4	G	1.557434E-02	2.395759E-02	3.781316E-01	-1.173831E-01	1.264242E-01	-8.111755E-03
5	G	1.397896E-02	1.802168E-02	2.851202E-01	-7.155243E-02	1.175483E-01	-6.828476E-03
6	G	8.799255E-03	9.808990E-03	1.594013E-01	-1.038471E-01	2.868074E-01	-1.926699E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.123760E-03	1.907763E-02	4.118276E-01	-1.522883E-01	-4.703957E-02	1.801957E-02
9	G	1.173673E-02	2.309178E-02	3.973374E-01	-1.165816E-01	4.540577E-02	1.045624E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 600 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.629870E-03	8.407970E-07	3.918271E-01	1.185501E-04	8.265704E-02	-1.927697E-06
2	G	1.175128E-02	2.429996E-02	4.603282E-01	-2.170943E-01	-2.636996E-02	1.617411E-02
3	G	1.515816E-02	2.917661E-02	4.570964E-01	-1.639923E-01	3.528786E-02	2.171247E-03
4	G	1.754496E-02	2.708412E-02	4.013935E-01	-1.252538E-01	1.346379E-01	-9.227378E-03
5	G	1.574795E-02	2.038338E-02	3.026541E-01	-7.523316E-02	1.243012E-01	-7.686487E-03
6	G	9.941270E-03	1.112005E-02	1.693839E-01	-1.118081E-01	3.042177E-01	-2.190648E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.026575E-02	2.153855E-02	4.370181E-01	-1.619864E-01	-5.001226E-02	2.037179E-02
9	G	1.320561E-02	2.607806E-02	4.216233E-01	-1.238992E-01	4.820328E-02	1.189183E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 600 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.422118E-03	1.037668E-06	4.122403E-01	1.519759E-04	9.761293E-02	-1.259408E-06
2	G	1.297866E-02	2.693999E-02	4.841300E-01	-2.295242E-01	-2.758041E-02	1.788112E-02
3	G	1.675797E-02	3.235335E-02	4.807531E-01	-1.732017E-01	3.680306E-02	2.459951E-03
4	G	1.940597E-02	3.004047E-02	4.221825E-01	-1.322469E-01	1.419519E-01	-1.028173E-02
5	G	1.741990E-02	2.261767E-02	3.183280E-01	-7.852962E-02	1.303618E-01	-8.499337E-03
6	G	1.102241E-02	1.236173E-02	1.783077E-01	-1.189483E-01	3.197044E-01	-2.441412E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.134093E-02	2.386272E-02	4.595433E-01	-1.706086E-01	-5.260197E-02	2.258859E-02
9	G	1.459112E-02	2.890068E-02	4.433392E-01	-1.303911E-01	5.067121E-02	1.331074E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 600 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.172152E-03	1.245198E-06	4.308202E-01	1.879870E-04	1.118645E-01	-2.030653E-07
2	G	1.414429E-02	2.945306E-02	5.057449E-01	-2.407325E-01	-2.864981E-02	1.950504E-02
3	G	1.827944E-02	3.537950E-02	5.022334E-01	-1.815227E-01	3.817359E-02	2.739589E-03
4	G	2.117779E-02	3.285848E-02	4.410621E-01	-1.385642E-01	1.485736E-01	-1.128587E-02
5	G	1.901301E-02	2.474851E-02	3.325661E-01	-8.153189E-02	1.358843E-01	-9.275415E-03
6	G	1.205407E-02	1.354707E-02	1.864146E-01	-1.254603E-01	3.337093E-01	-2.681505E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.236157E-02	2.607570E-02	4.800101E-01	-1.784029E-01	-5.489179E-02	2.469373E-02
9	G	1.590876E-02	3.159032E-02	4.630701E-01	-1.362472E-01	5.288468E-02	1.472065E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 600 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.886692E-03	1.462568E-06	4.479332E-01	2.263666E-04	1.254793E-01	1.258004E-06
2	G	1.525817E-02	3.185976E-02	5.256106E-01	-2.509654E-01	-2.960037E-02	2.105814E-02
3	G	1.973527E-02	3.827958E-02	5.219731E-01	-1.891333E-01	3.942550E-02	3.012115E-03
4	G	2.287495E-02	3.556084E-02	4.584146E-01	-1.443423E-01	1.546435E-01	-1.224780E-02
5	G	2.054025E-02	2.679296E-02	3.456561E-01	-8.430009E-02	1.409740E-01	-1.002069E-02
6	G	1.304437E-02	1.468534E-02	1.938684E-01	-1.314733E-01	3.465311E-01	-2.912717E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.333643E-02	2.819569E-02	4.988303E-01	-1.855366E-01	-5.693899E-02	2.670430E-02
9	G	1.716956E-02	3.416880E-02	4.812133E-01	-1.415959E-01	5.489479E-02	1.612629E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 600 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.057075E-02	1.689114E-06	4.638410E-01	2.669399E-04	1.385170E-01	3.136995E-06
2	G	1.632773E-02	3.417546E-02	5.440395E-01	-2.603984E-01	-3.044904E-02	2.254963E-02
3	G	2.113491E-02	4.107188E-02	5.402830E-01	-1.961604E-01	4.057798E-02	3.278951E-03
4	G	2.450827E-02	3.816441E-02	4.745129E-01	-1.496785E-01	1.602615E-01	-1.317350E-02
5	G	2.201124E-02	2.876369E-02	3.578033E-01	-8.687668E-02	1.457065E-01	-1.073962E-02
6	G	1.399935E-02	1.578345E-02	2.007862E-01	-1.370792E-01	3.583828E-01	-3.136380E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.427202E-02	3.023623E-02	5.162981E-01	-1.921286E-01	-5.878504E-02	2.863316E-02
9	G	1.838174E-02	3.665235E-02	4.980522E-01	-1.465286E-01	5.673813E-02	1.753068E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 650 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.396631E-03	7.263070E-08	2.201649E-01	4.494810E-06	-3.724009E-03	-5.894872E-07
2	G	3.733338E-03	7.218203E-03	2.580023E-01	-1.083646E-01	-1.638951E-02	5.185166E-03
3	G	4.784567E-03	8.669081E-03	2.558362E-01	-8.422542E-02	2.315117E-02	3.893589E-04
4	G	5.526516E-03	8.027871E-03	2.245599E-01	-6.433925E-02	7.115740E-02	-2.479697E-03
5	G	4.969585E-03	5.990875E-03	1.692969E-01	-4.660303E-02	7.445305E-02	-2.507282E-03
6	G	3.023440E-03	3.155019E-03	9.335927E-02	-5.052365E-02	1.693404E-01	-6.021464E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.245792E-03	6.485679E-03	2.459721E-01	-8.664273E-02	-2.591172E-02	5.979973E-03
9	G	4.213694E-03	7.850059E-03	2.373919E-01	-6.675060E-02	2.601795E-02	4.038124E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 650 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.755158E-03	1.827819E-07	2.743428E-01	1.752449E-05	1.454940E-02	-1.291294E-06
2	G	5.805083E-03	1.157723E-02	3.222111E-01	-1.430128E-01	-1.934065E-02	7.994456E-03
3	G	7.449385E-03	1.389610E-02	3.197241E-01	-1.094957E-01	2.683798E-02	8.217559E-04
4	G	8.606188E-03	1.288280E-02	2.807012E-01	-8.375679E-02	9.147172E-02	-4.167160E-03
5	G	7.731054E-03	9.655923E-03	2.116642E-01	-5.599204E-02	8.999249E-02	-3.826357E-03
6	G	4.781630E-03	5.171821E-03	1.175161E-01	-7.002407E-02	2.127371E-01	-1.000262E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	5.056229E-03	1.033808E-02	3.065618E-01	-1.108703E-01	-3.382880E-02	9.649805E-03
9	G	6.528255E-03	1.250733E-02	2.958363E-01	-8.517576E-02	3.326204E-02	5.887747E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 650 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.883074E-03	3.267453E-07	3.126891E-01	3.700026E-05	3.281844E-02	-1.865612E-06
2	G	7.529245E-03	1.523643E-02	3.674615E-01	-1.674676E-01	-2.161526E-02	1.034477E-02
3	G	9.678734E-03	1.828597E-02	3.647362E-01	-1.274290E-01	2.958900E-02	1.194421E-03
4	G	1.118685E-02	1.695864E-02	3.202405E-01	-9.742996E-02	1.056772E-01	-5.610404E-03
5	G	1.004384E-02	1.273155E-02	2.414681E-01	-6.235462E-02	1.011606E-01	-4.935806E-03
6	G	6.263141E-03	6.870555E-03	1.344988E-01	-8.361237E-02	2.429356E-01	-1.338188E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.566865E-03	1.356211E-02	3.492717E-01	-1.277603E-01	-3.925017E-02	1.273128E-02
9	G	8.461031E-03	1.640853E-02	3.370182E-01	-9.799194E-02	3.823913E-02	7.509108E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 650 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.880866E-03	4.832229E-07	3.433665E-01	6.056406E-05	5.029088E-02	-2.200558E-06
2	G	9.059840E-03	1.849913E-02	4.035305E-01	-1.867773E-01	-2.348521E-02	1.244656E-02
3	G	1.166297E-02	2.220309E-02	4.006049E-01	-1.416249E-01	3.183750E-02	1.533332E-03
4	G	1.348678E-02	2.059755E-02	3.517490E-01	-1.082404E-01	1.169221E-01	-6.905696E-03
5	G	1.210563E-02	1.547762E-02	2.652135E-01	-6.735756E-02	1.101670E-01	-5.929497E-03
6	G	7.588326E-03	8.390655E-03	1.480241E-01	-9.439775E-02	2.668065E-01	-1.641976E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.908457E-03	1.643467E-02	3.833414E-01	-1.410791E-01	-4.348105E-02	1.548135E-02
9	G	1.018037E-02	1.988805E-02	3.698675E-01	-1.080857E-01	4.214255E-02	9.027202E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 650 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.790385E-03	6.552416E-07	3.693512E-01	8.789029E-05	6.687338E-02	-2.238316E-06
2	G	1.045967E-02	2.149381E-02	4.339908E-01	-2.029590E-01	-2.507686E-02	1.438007E-02
3	G	1.348162E-02	2.580116E-02	4.308907E-01	-1.535591E-01	3.376107E-02	1.849474E-03
4	G	1.559746E-02	2.394175E-02	3.783560E-01	-1.173103E-01	1.263671E-01	-8.098488E-03
5	G	1.399900E-02	1.800276E-02	2.852669E-01	-7.157112E-02	1.178317E-01	-6.845107E-03
6	G	8.808253E-03	9.790523E-03	1.594444E-01	-1.035110E-01	2.868376E-01	-1.922846E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.135497E-03	1.907044E-02	4.121312E-01	-1.522503E-01	-4.697121E-02	1.800401E-02
9	G	1.175571E-02	2.308371E-02	3.976243E-01	-1.165331E-01	4.538889E-02	1.049287E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 650 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.634292E-03	8.403493E-07	3.921192E-01	1.184401E-04	8.260728E-02	-1.938713E-06
2	G	1.176285E-02	2.428970E-02	4.606077E-01	-2.169795E-01	-2.645431E-02	1.618767E-02
3	G	1.517761E-02	2.916295E-02	4.573506E-01	-1.639239E-01	3.544893E-02	2.149775E-03
4	G	1.756812E-02	2.706830E-02	4.016052E-01	-1.251836E-01	1.345835E-01	-9.213874E-03
5	G	1.576809E-02	2.036452E-02	3.027930E-01	-7.525361E-02	1.245681E-01	-7.703077E-03
6	G	9.950313E-03	1.110157E-02	1.694247E-01	-1.114910E-01	3.042472E-01	-2.186788E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.027751E-02	2.153139E-02	4.373045E-01	-1.619506E-01	-4.994826E-02	2.035625E-02
9	G	1.322462E-02	2.607003E-02	4.218940E-01	-1.238534E-01	4.818748E-02	1.192846E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 650 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.426571E-03	1.037163E-06	4.125181E-01	1.518511E-04	9.756389E-02	-1.272794E-06
2	G	1.299027E-02	2.692973E-02	4.843962E-01	-2.294141E-01	-2.766119E-02	1.789497E-02
3	G	1.677746E-02	3.233973E-02	4.809952E-01	-1.731366E-01	3.695671E-02	2.438296E-03
4	G	1.942918E-02	3.002469E-02	4.223841E-01	-1.321790E-01	1.418997E-01	-1.026805E-02
5	G	1.744011E-02	2.259867E-02	3.184606E-01	-7.855121E-02	1.306155E-01	-8.515896E-03
6	G	1.103149E-02	1.234325E-02	1.783467E-01	-1.186465E-01	3.197334E-01	-2.437549E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.135272E-02	2.385560E-02	4.598160E-01	-1.705746E-01	-5.254154E-02	2.257310E-02
9	G	1.461016E-02	2.889270E-02	4.435970E-01	-1.303476E-01	5.065635E-02	1.334724E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 650 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.176636E-03	1.244638E-06	4.310863E-01	1.878480E-04	1.118164E-01	-2.189290E-07
2	G	1.415594E-02	2.944286E-02	5.060000E-01	-2.406263E-01	-2.872758E-02	1.951911E-02
3	G	1.829896E-02	3.536592E-02	5.024656E-01	-1.814603E-01	3.832103E-02	2.717790E-03
4	G	2.120104E-02	3.284275E-02	4.412554E-01	-1.384984E-01	1.485233E-01	-1.127207E-02
5	G	1.903330E-02	2.472976E-02	3.326935E-01	-8.155423E-02	1.361270E-01	-9.291951E-03
6	G	1.206319E-02	1.352859E-02	1.864521E-01	-1.251711E-01	3.337378E-01	-2.677640E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.237339E-02	2.606863E-02	4.802715E-01	-1.783704E-01	-5.483436E-02	2.467830E-02
9	G	1.592783E-02	3.158239E-02	4.633172E-01	-1.362057E-01	5.287063E-02	1.475695E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 650 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.891205E-03	1.461955E-06	4.481894E-01	2.262143E-04	1.254320E-01	1.239571E-06
2	G	1.526986E-02	3.184960E-02	5.258564E-01	-2.508627E-01	-2.967553E-02	2.107240E-02
3	G	1.975483E-02	3.826606E-02	5.221969E-01	-1.890732E-01	3.956765E-02	2.990199E-03
4	G	2.289824E-02	3.554516E-02	4.586009E-01	-1.442783E-01	1.545949E-01	-1.223389E-02
5	G	2.056060E-02	2.677428E-02	3.457791E-01	-8.432294E-02	1.412075E-01	-1.003721E-02
6	G	1.305352E-02	1.466686E-02	1.939047E-01	-1.311949E-01	3.465592E-01	-2.908852E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.334827E-02	2.818866E-02	4.990821E-01	-1.855055E-01	-5.688414E-02	2.668894E-02
9	G	1.718866E-02	3.416091E-02	4.814514E-01	-1.415562E-01	5.488146E-02	1.616233E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 650 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.057529E-02	1.688448E-06	4.640886E-01	2.667747E-04	1.384707E-01	3.115913E-06
2	G	1.633945E-02	3.416533E-02	5.442774E-01	-2.602990E-01	-3.052193E-02	2.256406E-02
3	G	2.115451E-02	4.105841E-02	5.404996E-01	-1.961025E-01	4.071552E-02	3.256938E-03
4	G	2.453160E-02	3.814878E-02	4.746933E-01	-1.496163E-01	1.602145E-01	-1.315951E-02
5	G	2.203165E-02	2.874507E-02	3.579225E-01	-8.689986E-02	1.459319E-01	-1.075613E-02
6	G	1.400853E-02	1.576498E-02	2.008214E-01	-1.368101E-01	3.584107E-01	-3.132516E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.428389E-02	3.022925E-02	5.165417E-01	-1.920987E-01	-5.873244E-02	2.861787E-02
9	G	1.840086E-02	3.664452E-02	4.982825E-01	-1.464904E-01	5.672544E-02	1.756643E-03

LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 700 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.400796E-03	7.251109E-08	2.206867E-01	4.494347E-06	-3.746119E-03	-5.919482E-07
2	G	3.744928E-03	7.207649E-03	2.584939E-01	-1.081356E-01	-1.650461E-02	5.193141E-03
3	G	4.803563E-03	8.654914E-03	2.562785E-01	-8.401910E-02	2.340826E-02	3.729377E-04
4	G	5.549120E-03	8.012180E-03	2.249325E-01	-6.422967E-02	7.107346E-02	-2.469299E-03
5	G	4.988766E-03	5.971931E-03	1.695355E-01	-4.656918E-02	7.492381E-02	-2.523085E-03
6	G	3.032032E-03	3.137155E-03	9.343208E-02	-4.997508E-02	1.693791E-01	-5.978626E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.257347E-03	6.478677E-03	2.464812E-01	-8.654481E-02	-2.581581E-02	5.967109E-03
9	G	4.232634E-03	7.842526E-03	2.378772E-01	-6.665990E-02	2.600576E-02	4.060643E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 700 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.759353E-03	2.111261E-07	2.747613E-01	1.944848E-05	1.450293E-02	-1.318511E-06
2	G	5.816979E-03	1.156576E-02	3.225980E-01	-1.427488E-01	-1.943334E-02	8.005741E-03
3	G	7.468268E-03	1.388118E-02	3.200709E-01	-1.092736E-01	2.704347E-02	8.041790E-04
4	G	8.628608E-03	1.286661E-02	2.809948E-01	-8.364225E-02	9.139358E-02	-4.153945E-03
5	G	7.750126E-03	9.636614E-03	2.118528E-01	-5.597922E-02	9.037520E-02	-3.843276E-03
6	G	4.789955E-03	5.153475E-03	1.175702E-01	-6.956083E-02	2.127638E-01	-9.963267E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	5.067773E-03	1.033084E-02	3.069702E-01	-1.107574E-01	-3.375575E-02	9.636107E-03
9	G	6.547260E-03	1.249966E-02	2.962277E-01	-8.508676E-02	3.325507E-02	5.915537E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 700 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.887389E-03	3.354119E-07	3.130583E-01	3.760235E-05	3.276815E-02	-1.859002E-06
2	G	7.541316E-03	1.522489E-02	3.678037E-01	-1.672227E-01	-2.169714E-02	1.035714E-02
3	G	9.697783E-03	1.827105E-02	3.650435E-01	-1.272249E-01	2.976806E-02	1.176383E-03
4	G	1.120956E-02	1.694284E-02	3.205025E-01	-9.732803E-02	1.056052E-01	-5.596571E-03
5	G	1.006348E-02	1.271258E-02	2.416396E-01	-6.236218E-02	1.014952E-01	-4.952566E-03
6	G	6.271870E-03	6.852221E-03	1.345493E-01	-8.321395E-02	2.429681E-01	-1.334345E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.578496E-03	1.355499E-02	3.496337E-01	-1.276608E-01	-3.919065E-02	1.271779E-02
9	G	8.480207E-03	1.640101E-02	3.373659E-01	-9.791594E-02	3.823468E-02	7.536215E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 700 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.885221E-03	4.828740E-07	3.436994E-01	6.048769E-05	5.024106E-02	-2.207328E-06
2	G	9.071305E-03	1.848895E-02	4.038491E-01	-1.866545E-01	-2.358011E-02	1.245930E-02
3	G	1.168236E-02	2.218951E-02	4.008946E-01	-1.415514E-01	3.202000E-02	1.512347E-03
4	G	1.350987E-02	2.058179E-02	3.519902E-01	-1.081658E-01	1.168618E-01	-6.892829E-03
5	G	1.212559E-02	1.545890E-02	2.653707E-01	-6.737387E-02	1.104721E-01	-5.946197E-03
6	G	7.597264E-03	8.372276E-03	1.480703E-01	-9.403708E-02	2.668376E-01	-1.638143E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.920173E-03	1.642749E-02	3.836672E-01	-1.410402E-01	-4.340646E-02	1.546573E-02
9	G	1.019932E-02	1.987998E-02	3.701754E-01	-1.080345E-01	4.212375E-02	9.064068E-04

FIVE TENTHS, 700 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.794775E-03	6.548590E-07	3.696609E-01	8.779628E-05	6.682339E-02	-2.247071E-06
2	G	1.047119E-02	2.148359E-02	4.342872E-01	-2.028406E-01	-2.516597E-02	1.439329E-02
3	G	1.350104E-02	2.578754E-02	4.311603E-01	-1.534885E-01	3.393159E-02	1.828201E-03
4	G	1.562059E-02	2.392595E-02	3.785804E-01	-1.172380E-01	1.263099E-01	-8.085255E-03
5	G	1.401906E-02	1.798388E-02	2.854137E-01	-7.159010E-02	1.181153E-01	-6.861753E-03
6	G	8.817239E-03	9.772078E-03	1.594875E-01	-1.031748E-01	2.868677E-01	-1.918997E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.147238E-03	1.906328E-02	4.124345E-01	-1.522132E-01	-4.690250E-02	1.798842E-02
9	G	1.177469E-02	2.307567E-02	3.979111E-01	-1.164849E-01	4.537165E-02	1.052979E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 700 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.638715E-03	8.399069E-07	3.924111E-01	1.183303E-04	8.255768E-02	-1.949713E-06
2	G	1.177442E-02	2.427948E-02	4.608873E-01	-2.168658E-01	-2.653898E-02	1.620126E-02
3	G	1.519707E-02	2.914934E-02	4.576049E-01	-1.638566E-01	3.561024E-02	2.128274E-03
4	G	1.759129E-02	2.705253E-02	4.018169E-01	-1.251136E-01	1.345289E-01	-9.200392E-03
5	G	1.578823E-02	2.034569E-02	3.029319E-01	-7.527426E-02	1.248352E-01	-7.719683E-03
6	G	9.959340E-03	1.108311E-02	1.694655E-01	-1.111736E-01	3.042766E-01	-2.182931E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.028928E-02	2.152426E-02	4.375907E-01	-1.619153E-01	-4.988401E-02	2.034070E-02
9	G	1.324363E-02	2.606203E-02	4.221647E-01	-1.238078E-01	4.817142E-02	1.196533E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 700 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.431026E-03	1.036662E-06	4.127959E-01	1.517265E-04	9.751497E-02	-1.286165E-06
2	G	1.300189E-02	2.691955E-02	4.846623E-01	-2.293046E-01	-2.774222E-02	1.790884E-02
3	G	1.679695E-02	3.232615E-02	4.812374E-01	-1.730722E-01	3.711055E-02	2.416618E-03
4	G	1.945239E-02	3.000895E-02	4.225858E-01	-1.321113E-01	1.418473E-01	-1.025439E-02
5	G	1.746033E-02	2.258009E-02	3.185932E-01	-7.857293E-02	1.308694E-01	-8.532472E-03
6	G	1.104056E-02	1.232478E-02	1.783857E-01	-1.183443E-01	3.197623E-01	-2.433687E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.136452E-02	2.384851E-02	4.600886E-01	-1.705410E-01	-5.248091E-02	2.255760E-02
9	G	1.462920E-02	2.888474E-02	4.438547E-01	-1.303043E-01	5.064128E-02	1.338395E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 700 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.181120E-03	1.244082E-06	4.313523E-01	1.877094E-04	1.117683E-01	-2.347758E-07
2	G	1.416760E-02	2.943268E-02	5.062551E-01	-2.405206E-01	-2.880555E-02	1.953322E-02
3	G	1.831850E-02	3.535238E-02	5.026978E-01	-1.813984E-01	3.846865E-02	2.695971E-03
4	G	2.122429E-02	3.282705E-02	4.414487E-01	-1.384327E-01	1.484729E-01	-1.125827E-02
5	G	1.905358E-02	2.471106E-02	3.328209E-01	-8.157667E-02	1.363699E-01	-9.308504E-03
6	G	1.207229E-02	1.351012E-02	1.864895E-01	-1.248816E-01	3.337662E-01	-2.673776E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.238521E-02	2.606158E-02	4.805328E-01	-1.783383E-01	-5.477677E-02	2.466286E-02
9	G	1.594690E-02	3.157447E-02	4.635643E-01	-1.361644E-01	5.285641E-02	1.479342E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 700 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.895717E-03	1.461344E-06	4.484455E-01	2.260622E-04	1.253849E-01	1.221156E-06
2	G	1.528154E-02	3.183946E-02	5.261022E-01	-2.507605E-01	-2.975088E-02	2.108669E-02
3	G	1.977440E-02	3.825257E-02	5.224206E-01	-1.890136E-01	3.970994E-02	2.968265E-03
4	G	2.292153E-02	3.552950E-02	4.587873E-01	-1.442145E-01	1.545462E-01	-1.221999E-02
5	G	2.058095E-02	2.675563E-02	3.459021E-01	-8.434586E-02	1.414411E-01	-1.005375E-02
6	G	1.306265E-02	1.464840E-02	1.939409E-01	-1.309162E-01	3.465873E-01	-2.904987E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.336012E-02	2.818165E-02	4.993339E-01	-1.854746E-01	-5.682915E-02	2.667357E-02
9	G	1.720776E-02	3.415305E-02	4.816894E-01	-1.415165E-01	5.486799E-02	1.619853E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 700 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.057990E-02	1.687764E-06	4.643387E-01	2.666049E-04	1.384259E-01	3.095127E-06
2	G	1.635127E-02	3.415544E-02	5.445182E-01	-2.602017E-01	-3.059519E-02	2.257865E-02
3	G	2.117423E-02	4.104521E-02	5.407192E-01	-1.960463E-01	4.085343E-02	3.234898E-03
4	G	2.455507E-02	3.813339E-02	4.748762E-01	-1.495552E-01	1.601683E-01	-1.314569E-02
5	G	2.205218E-02	2.872662E-02	3.580437E-01	-8.692354E-02	1.461583E-01	-1.077274E-02
6	G	1.401778E-02	1.574662E-02	2.008577E-01	-1.365416E-01	3.584404E-01	-3.128687E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.429585E-02	3.022246E-02	5.167881E-01	-1.920702E-01	-5.868009E-02	2.860277E-02
9	G	1.842009E-02	3.663691E-02	4.985155E-01	-1.464532E-01	5.671296E-02	1.760213E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 750 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.405020E-03	7.243550E-08	2.212085E-01	4.454281E-06	-3.798146E-03	-5.925373E-07
2	G	3.755897E-03	7.199269E-03	2.590016E-01	-1.080606E-01	-1.665000E-02	5.202679E-03
3	G	4.823062E-03	8.643380E-03	2.567441E-01	-8.400698E-02	2.368721E-02	3.532889E-04
4	G	5.572481E-03	7.997682E-03	2.253179E-01	-6.418441E-02	7.100501E-02	-2.459743E-03
5	G	5.008277E-03	5.953457E-03	1.697781E-01	-4.655251E-02	7.540581E-02	-2.541144E-03
6	G	3.040609E-03	3.119446E-03	9.350540E-02	-4.942478E-02	1.694186E-01	-5.949086E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.269059E-03	6.472060E-03	2.469896E-01	-8.653062E-02	-2.568689E-02	5.951175E-03
9	G	4.251397E-03	7.834758E-03	2.383526E-01	-6.660961E-02	2.597188E-02	4.097794E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 750 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.763608E-03	2.090071E-07	2.751781E-01	1.927368E-05	1.445781E-02	-1.320034E-06
2	G	5.828347E-03	1.155579E-02	3.229961E-01	-1.426058E-01	-1.954606E-02	8.016753E-03
3	G	7.487546E-03	1.386781E-02	3.204326E-01	-1.091806E-01	2.726624E-02	7.845075E-04
4	G	8.651583E-03	1.285102E-02	2.812962E-01	-8.356129E-02	9.132352E-02	-4.142356E-03
5	G	7.769720E-03	9.617686E-03	2.120466E-01	-5.598005E-02	9.075785E-02	-3.860175E-03
6	G	4.798657E-03	5.135298E-03	1.176275E-01	-6.911182E-02	2.127973E-01	-9.925666E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	5.079425E-03	1.032375E-02	3.073770E-01	-1.107083E-01	-3.366301E-02	9.620905E-03
9	G	6.566137E-03	1.249172E-02	2.966121E-01	-8.502465E-02	3.323302E-02	5.949977E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 750 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.891691E-03	3.133195E-07	3.134237E-01	3.590163E-05	3.271918E-02	-1.889497E-06
2	G	7.552533E-03	1.521530E-02	3.681568E-01	-1.671305E-01	-2.180711E-02	1.036926E-02
3	G	9.717239E-03	1.825805E-02	3.653658E-01	-1.271872E-01	2.997446E-02	1.154967E-03
4	G	1.123270E-02	1.692721E-02	3.207683E-01	-9.725703E-02	1.055439E-01	-5.584661E-03
5	G	1.008327E-02	1.269364E-02	2.418109E-01	-6.237239E-02	1.018319E-01	-4.969445E-03
6	G	6.280672E-03	6.833890E-03	1.345996E-01	-8.281651E-02	2.429993E-01	-1.330514E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.590212E-03	1.354785E-02	3.499905E-01	-1.276373E-01	-3.910023E-02	1.270160E-02
9	G	8.499039E-03	1.639283E-02	3.377010E-01	-9.786676E-02	3.820858E-02	7.575958E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 750 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.889570E-03	4.826184E-07	3.440323E-01	6.040931E-05	5.019139E-02	-2.213748E-06
2	G	9.082793E-03	1.847876E-02	4.041672E-01	-1.865286E-01	-2.367481E-02	1.247210E-02
3	G	1.170173E-02	2.217591E-02	4.011839E-01	-1.414748E-01	3.220236E-02	1.491414E-03
4	G	1.353295E-02	2.056602E-02	3.522310E-01	-1.080904E-01	1.168011E-01	-6.879908E-03
5	G	1.214551E-02	1.543999E-02	2.655276E-01	-6.738991E-02	1.107776E-01	-5.962927E-03
6	G	7.606151E-03	8.353881E-03	1.481163E-01	-9.367534E-02	2.668682E-01	-1.634306E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.931883E-03	1.642033E-02	3.839930E-01	-1.409999E-01	-4.333232E-02	1.545021E-02
9	G	1.021827E-02	1.987195E-02	3.704833E-01	-1.079828E-01	4.210523E-02	9.100715E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 750 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.799162E-03	6.544758E-07	3.699705E-01	8.770252E-05	6.677356E-02	-2.255820E-06
2	G	1.048272E-02	2.147338E-02	4.345834E-01	-2.027209E-01	-2.525512E-02	1.440657E-02
3	G	1.352046E-02	2.577394E-02	4.314297E-01	-1.534168E-01	3.410217E-02	1.806941E-03
4	G	1.564371E-02	2.391018E-02	3.788046E-01	-1.171654E-01	1.262524E-01	-8.072000E-03
5	G	1.403909E-02	1.796501E-02	2.855604E-01	-7.160895E-02	1.183992E-01	-6.878426E-03
6	G	8.826184E-03	9.753646E-03	1.595305E-01	-1.028378E-01	2.868975E-01	-1.915147E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.158978E-03	1.905614E-02	4.127379E-01	-1.521756E-01	-4.683390E-02	1.797288E-02
9	G	1.179367E-02	2.306767E-02	3.981979E-01	-1.164365E-01	4.535444E-02	1.056667E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 750 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.643136E-03	8.394632E-07	3.927030E-01	1.182209E-04	8.250824E-02	-1.960703E-06
2	G	1.178600E-02	2.426927E-02	4.611667E-01	-2.167513E-01	-2.662371E-02	1.621490E-02
3	G	1.521653E-02	2.913576E-02	4.578591E-01	-1.637887E-01	3.577162E-02	2.106780E-03
4	G	1.761446E-02	2.703677E-02	4.020285E-01	-1.250436E-01	1.344741E-01	-9.186900E-03
5	G	1.580835E-02	2.032688E-02	3.030707E-01	-7.529485E-02	1.251025E-01	-7.736312E-03
6	G	9.968336E-03	1.106466E-02	1.695062E-01	-1.108557E-01	3.043057E-01	-2.179073E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.030105E-02	2.151715E-02	4.378770E-01	-1.618798E-01	-4.981981E-02	2.032519E-02
9	G	1.326264E-02	2.605406E-02	4.224353E-01	-1.237621E-01	4.815535E-02	1.200220E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 750 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.435479E-03	1.036161E-06	4.130735E-01	1.516023E-04	9.746622E-02	-1.299518E-06
2	G	1.301351E-02	2.690937E-02	4.849284E-01	-2.291946E-01	-2.782332E-02	1.792275E-02
3	G	1.681645E-02	3.231259E-02	4.814795E-01	-1.730074E-01	3.726447E-02	2.394944E-03
4	G	1.947560E-02	2.999322E-02	4.227873E-01	-1.320435E-01	1.417948E-01	-1.024072E-02
5	G	1.748053E-02	2.256134E-02	3.187257E-01	-7.859464E-02	1.311234E-01	-8.549068E-03
6	G	1.104959E-02	1.230632E-02	1.784245E-01	-1.180418E-01	3.197910E-01	-2.429825E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.137631E-02	2.364144E-02	4.603611E-01	-1.705072E-01	-5.242030E-02	2.254213E-02
9	G	1.464825E-02	2.867681E-02	4.441124E-01	-1.302609E-01	5.062617E-02	1.342067E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 750 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.185603E-03	1.243526E-06	4.316183E-01	1.875711E-04	1.117204E-01	-2.506002E-07
2	G	1.417925E-02	2.942253E-02	5.065101E-01	-2.404146E-01	-2.888359E-02	1.954734E-02
3	G	1.833803E-02	3.533886E-02	5.029299E-01	-1.813364E-01	3.861633E-02	2.674154E-03
4	G	2.124754E-02	3.281137E-02	4.416420E-01	-1.383669E-01	1.484223E-01	-1.124447E-02
5	G	1.907386E-02	2.469236E-02	3.329482E-01	-8.159911E-02	1.366130E-01	-9.325075E-03
6	G	1.208137E-02	1.349166E-02	1.865269E-01	-1.245918E-01	3.337945E-01	-2.669912E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.239704E-02	2.605454E-02	4.807940E-01	-1.783060E-01	-5.471918E-02	2.464744E-02
9	G	1.596597E-02	3.156659E-02	4.638112E-01	-1.361230E-01	5.284215E-02	1.482992E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 750 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.900228E-03	1.460734E-06	4.487016E-01	2.259106E-04	1.253379E-01	1.202769E-06
2	G	1.529323E-02	3.182934E-02	5.263479E-01	-2.506580E-01	-2.982629E-02	2.110100E-02
3	G	1.979396E-02	3.823910E-02	5.226444E-01	-1.889539E-01	3.985230E-02	2.946332E-03
4	G	2.294482E-02	3.551386E-02	4.589735E-01	-1.441506E-01	1.544974E-01	-1.220609E-02
5	G	2.060129E-02	2.673698E-02	3.460251E-01	-8.436879E-02	1.416748E-01	-1.007030E-02
6	G	1.307177E-02	1.462995E-02	1.939771E-01	-1.306372E-01	3.466152E-01	-2.901123E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.337197E-02	2.817466E-02	4.995856E-01	-1.854437E-01	-5.677415E-02	2.665821E-02
9	G	1.722686E-02	3.414521E-02	4.819274E-01	-1.414769E-01	5.485447E-02	1.623476E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 750 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.058443E-02	1.667102E-06	4.645862E-01	2.664404E-04	1.383798E-01	3.074097E-06
2	G	1.636299E-02	3.414536E-02	5.447560E-01	-2.601024E-01	-3.066830E-02	2.259312E-02
3	G	2.119383E-02	4.103179E-02	5.409357E-01	-1.959887E-01	4.099115E-02	3.212870E-03
4	G	2.457840E-02	3.811780E-02	4.750564E-01	-1.494931E-01	1.601210E-01	-1.313171E-02
5	G	2.207258E-02	2.872804E-02	3.581629E-01	-8.694680E-02	1.463839E-01	-1.078928E-02
6	G	1.402692E-02	1.572817E-02	2.008928E-01	-1.362720E-01	3.584681E-01	-3.124823E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.430772E-02	3.021551E-02	5.170316E-01	-1.920404E-01	-5.862736E-02	2.858748E-02
9	G	1.843922E-02	3.662911E-02	4.987457E-01	-1.464151E-01	5.670011E-02	1.763805E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 800 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.409217E-03	7.233949E-08	2.217295E-01	4.434285E-06	-3.834364E-03	-5.940812E-07
2	G	3.767214E-03	7.189996E-03	2.595004E-01	-1.079043E-01	-1.678030E-02	5.211547E-03
3	G	4.842312E-03	8.630650E-03	2.571973E-01	-8.389262E-02	2.395480E-02	3.353807E-04
4	G	5.595482E-03	7.982764E-03	2.256968E-01	-6.410769E-02	7.092697E-02	-2.449727E-03
5	G	5.027640E-03	5.934914E-03	1.700190E-01	-4.652965E-02	7.588313E-02	-2.558075E-03
6	G	3.049131E-03	3.101758E-03	9.357842E-02	-4.887508E-02	1.694576E-01	-5.913106E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.280696E-03	6.465385E-03	2.474979E-01	-8.647330E-02	-2.557588E-02	5.937027E-03
9	G	4.270277E-03	7.827287E-03	2.388329E-01	-6.653942E-02	2.594907E-02	4.127356E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 800 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.767862E-03	2.069973E-07	2.755946E-01	1.910698E-05	1.441305E-02	-1.321631E-06
2	G	5.839716E-03	1.154590E-02	3.233941E-01	-1.424637E-01	-1.965939E-02	8.027831E-03
3	G	7.506829E-03	1.385451E-02	3.207943E-01	-1.090887E-01	2.748950E-02	7.648080E-04
4	G	8.674560E-03	1.283551E-02	2.815975E-01	-8.348065E-02	9.125303E-02	-4.130782E-03
5	G	7.789301E-03	9.598613E-03	2.122403E-01	-5.598110E-02	9.114101E-02	-3.877098E-03
6	G	4.807315E-03	5.117154E-03	1.176847E-01	-6.866191E-02	2.128305E-01	-9.888115E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	5.091081E-03	1.031672E-02	3.077836E-01	-1.106599E-01	-3.356996E-02	9.605721E-03
9	G	6.585016E-03	1.248383E-02	2.969963E-01	-8.496284E-02	3.321057E-02	5.984635E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 800 DEG SUBCASE 30
LOAD STEP = 4.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.895988E-03	3.025601E-07	3.137889E-01	3.504160E-05	3.267023E-02	-1.906364E-06
2	G	7.563999E-03	1.520512E-02	3.685051E-01	-1.669908E-01	-2.190826E-02	1.038142E-02
3	G	9.736546E-03	1.824448E-02	3.656821E-01	-1.270972E-01	3.017187E-02	1.134657E-03
4	G	1.125570E-02	1.691151E-02	3.210321E-01	-9.717766E-02	1.054782E-01	-5.572170E-03
5	G	1.010305E-02	1.267473E-02	2.419820E-01	-6.238367E-02	1.021677E-01	-4.986264E-03
6	G	6.289448E-03	6.815590E-03	1.346498E-01	-8.241998E-02	2.430308E-01	-1.326708E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.601885E-03	1.354073E-02	3.503475E-01	-1.275905E-01	-3.901977E-02	1.268629E-02
9	G	8.517966E-03	1.638487E-02	3.380387E-01	-9.780969E-02	3.818903E-02	7.611650E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 800 DEG SUBCASE 40
LOAD STEP = 5.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.893919E-03	4.822714E-07	3.443650E-01	6.033322E-05	5.014195E-02	-2.220505E-06
2	G	9.094284E-03	1.846860E-02	4.044853E-01	-1.864029E-01	-2.376981E-02	1.248495E-02
3	G	1.172111E-02	2.216236E-02	4.014731E-01	-1.413986E-01	3.238497E-02	1.470464E-03
4	G	1.355602E-02	2.055029E-02	3.524718E-01	-1.080152E-01	1.167401E-01	-6.866996E-03
5	G	1.216542E-02	1.542111E-02	2.656844E-01	-6.740604E-02	1.110834E-01	-5.979680E-03
6	G	7.615007E-03	8.335505E-03	1.481622E-01	-9.331303E-02	2.668985E-01	-1.630472E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.943596E-03	1.641321E-02	3.843186E-01	-1.409598E-01	-4.325803E-02	1.543470E-02
9	G	1.023722E-02	1.986396E-02	3.707911E-01	-1.079311E-01	4.208649E-02	9.137515E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 259

FIVE TENTHS, 800 DEG SUBCASE 50
LOAD STEP = 6.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.803548E-03	6.540931E-07	3.702801E-01	8.760913E-05	6.672394E-02	-2.264563E-06
2	G	1.049426E-02	2.146320E-02	4.348795E-01	-2.026014E-01	-2.534450E-02	1.441989E-02
3	G	1.353988E-02	2.576037E-02	4.316990E-01	-1.533454E-01	3.427294E-02	1.785669E-03
4	G	1.566683E-02	2.389444E-02	3.790288E-01	-1.170929E-01	1.261947E-01	-8.058753E-03
5	G	1.405911E-02	1.794618E-02	2.857069E-01	-7.162790E-02	1.186834E-01	-6.895120E-03
6	G	8.835103E-03	9.735231E-03	1.595734E-01	-1.025003E-01	2.869271E-01	-1.911298E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.170719E-03	1.904903E-02	4.130411E-01	-1.521381E-01	-4.676519E-02	1.795735E-02
9	G	1.181266E-02	2.305970E-02	3.984845E-01	-1.163882E-01	4.533708E-02	1.060367E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 800 DEG SUBCASE 60
LOAD STEP = 7.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.647557E-03	8.390211E-07	3.929948E-01	1.181119E-04	8.245897E-02	-1.971680E-06
2	G	1.179758E-02	2.425909E-02	4.614461E-01	-2.166370E-01	-2.670863E-02	1.622856E-02
3	G	1.523599E-02	2.912220E-02	4.581133E-01	-1.637211E-01	3.593316E-02	2.085275E-03
4	G	1.763763E-02	2.702105E-02	4.022401E-01	-1.249736E-01	1.344191E-01	-9.173414E-03
5	G	1.582847E-02	2.030809E-02	3.032095E-01	-7.531551E-02	1.253701E-01	-7.752960E-03
6	G	9.977307E-03	1.104623E-02	1.695468E-01	-1.105374E-01	3.043347E-01	-2.175217E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.031282E-02	2.151007E-02	4.381631E-01	-1.618444E-01	-4.975551E-02	2.030968E-02
9	G	1.328166E-02	2.604611E-02	4.227058E-01	-1.237165E-01	4.813914E-02	1.203917E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 800 DEG SUBCASE 70
LOAD STEP = 8.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.439931E-03	1.035662E-06	4.133511E-01	1.514784E-04	9.741759E-02	-1.312855E-06
2	G	1.302513E-02	2.689921E-02	4.851944E-01	-2.290847E-01	-2.790459E-02	1.793668E-02
3	G	1.683594E-02	3.229906E-02	4.817216E-01	-1.729429E-01	3.741853E-02	2.373259E-03
4	G	1.949881E-02	2.997753E-02	4.229888E-01	-1.319758E-01	1.417421E-01	-1.022706E-02
5	G	1.750073E-02	2.254261E-02	3.188582E-01	-7.861640E-02	1.313777E-01	-8.565682E-03
6	G	1.105861E-02	1.228788E-02	1.784633E-01	-1.177388E-01	3.198195E-01	-2.425964E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.138811E-02	2.383438E-02	4.606336E-01	-1.704736E-01	-5.235960E-02	2.252666E-02
9	G	1.466729E-02	2.886891E-02	4.443699E-01	-1.302176E-01	5.061096E-02	1.345749E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 800 DEG SUBCASE 80
LOAD STEP = 9.00000E+00

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.190085E-03	1.242971E-06	4.318842E-01	1.874332E-04	1.116726E-01	-2.664049E-07
2	G	1.419091E-02	2.941239E-02	5.067651E-01	-2.403087E-01	-2.896178E-02	1.956150E-02
3	G	1.835756E-02	3.532537E-02	5.031620E-01	-1.812745E-01	3.876413E-02	2.652328E-03
4	G	2.127079E-02	3.279571E-02	4.418352E-01	-1.383013E-01	1.483717E-01	-1.123068E-02
5	G	1.909413E-02	2.467368E-02	3.330756E-01	-8.162159E-02	1.368562E-01	-9.341664E-03
6	G	1.209042E-02	1.347322E-02	1.865643E-01	-1.243016E-01	3.338226E-01	-2.666049E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.240886E-02	2.604753E-02	4.810552E-01	-1.782739E-01	-5.466152E-02	2.463203E-02
9	G	1.598505E-02	3.155873E-02	4.640582E-01	-1.360816E-01	5.282779E-02	1.486651E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 800 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.904739E-03	1.460126E-06	4.489576E-01	2.257592E-04	1.252910E-01	1.184404E-06
2	G	1.530493E-02	3.181924E-02	5.265937E-01	-2.505556E-01	-2.990182E-02	2.111534E-02
3	G	1.981353E-02	3.822565E-02	5.228681E-01	-1.888944E-01	3.999476E-02	2.924391E-03
4	G	2.296811E-02	3.549825E-02	4.591597E-01	-1.440868E-01	1.544485E-01	-1.219219E-02
5	G	2.062162E-02	2.671836E-02	3.461480E-01	-8.439176E-02	1.419087E-01	-1.008687E-02
6	G	1.308086E-02	1.461151E-02	1.940132E-01	-1.303578E-01	3.466430E-01	-2.897259E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.338382E-02	2.816769E-02	4.998373E-01	-1.854129E-01	-5.671909E-02	2.664286E-02
9	G	1.724596E-02	3.413739E-02	4.821653E-01	-1.414373E-01	5.484086E-02	1.627107E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 800 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.058897E-02	1.686442E-06	4.648337E-01	2.662762E-04	1.383338E-01	3.053091E-06
2	G	1.637471E-02	3.413530E-02	5.449938E-01	-2.600031E-01	-3.074152E-02	2.260761E-02
3	G	2.121343E-02	4.101840E-02	5.411522E-01	-1.959312E-01	4.112897E-02	3.190834E-03
4	G	2.460172E-02	3.810223E-02	4.752367E-01	-1.494310E-01	1.600737E-01	-1.311774E-02
5	G	2.209298E-02	2.868947E-02	3.582820E-01	-8.697009E-02	1.466097E-01	-1.080584E-02
6	G	1.403605E-02	1.570974E-02	2.009279E-01	-1.360021E-01	3.584956E-01	-3.120959E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.431960E-02	3.020857E-02	5.172750E-01	-1.920108E-01	-5.857456E-02	2.857220E-02
9	G	1.845835E-02	3.662134E-02	4.989759E-01	-1.463770E-01	5.668717E-02	1.767406E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 255

ONE TENTH, 850 DEG
LOAD STEP = 2.00000E+00 SUBCASE 10

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	2.413418E-03	7.224163E-08	2.222500E-01	4.413967E-06	-3.870352E-03	-5.956138E-07
2	G	3.778560E-03	7.180582E-03	2.599986E-01	-1.077444E-01	-1.691037E-02	5.220483E-03
3	G	4.861564E-03	8.617995E-03	2.576499E-01	-8.377372E-02	2.422177E-02	3.175886E-04
4	G	5.618501E-03	7.967975E-03	2.260758E-01	-6.403174E-02	7.084761E-02	-2.439675E-03
5	G	5.047027E-03	5.916492E-03	1.702601E-01	-4.650891E-02	7.636105E-02	-2.575012E-03
6	G	3.057620E-03	3.084141E-03	9.365150E-02	-4.832567E-02	1.694968E-01	-5.877363E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	3.292335E-03	6.458806E-03	2.480060E-01	-8.641482E-02	-2.546616E-02	5.923080E-03
9	G	4.289178E-03	7.819947E-03	2.393133E-01	-6.646952E-02	2.592663E-02	4.156616E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 256

TWO TENTHS, 850 DEG
LOAD STEP = 3.00000E+00 SUBCASE 20

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	3.772129E-03	1.882832E-07	2.760105E-01	1.780172E-05	1.436925E-02	-1.309143E-06
2	G	5.850880E-03	1.153663E-02	3.237965E-01	-1.423677E-01	-1.978103E-02	8.038891E-03
3	G	7.526264E-03	1.384186E-02	3.211616E-01	-1.090465E-01	2.772048E-02	7.441988E-04
4	G	8.697723E-03	1.282023E-02	2.819012E-01	-8.341078E-02	9.118555E-02	-4.119762E-03
5	G	7.809015E-03	9.580082E-03	2.124352E-01	-5.598504E-02	9.152503E-02	-3.894025E-03
6	G	4.816039E-03	5.099081E-03	1.177426E-01	-6.821406E-02	2.128647E-01	-9.850820E-03
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	5.102781E-03	1.030977E-02	3.081896E-01	-1.106357E-01	-3.346835E-02	9.589828E-03
9	G	6.603840E-03	1.247585E-02	2.973777E-01	-8.491036E-02	3.318162E-02	6.022662E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 257

THREE TENTHS, 850 DEG
LOAD STEP = 4.00000E+00 SUBCASE 30

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	4.900307E-03	3.242815E-07	3.141540E-01	3.665649E-05	3.262341E-02	-1.885886E-06
2	G	7.575484E-03	1.519500E-02	3.688534E-01	-1.668504E-01	-2.200970E-02	1.039363E-02
3	G	9.755863E-03	1.823097E-02	3.659984E-01	-1.270069E-01	3.036955E-02	1.114339E-03
4	G	1.127871E-02	1.689588E-02	3.212960E-01	-9.709845E-02	1.054122E-01	-5.559691E-03
5	G	1.012281E-02	1.265587E-02	2.421531E-01	-6.239516E-02	1.025038E-01	-5.003108E-03
6	G	6.298190E-03	6.797316E-03	1.346999E-01	-8.202291E-02	2.430620E-01	-1.322906E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	6.613571E-03	1.353366E-02	3.507046E-01	-1.275435E-01	-3.893945E-02	1.267102E-02
9	G	8.536905E-03	1.637698E-02	3.383765E-01	-9.775277E-02	3.816962E-02	7.647147E-04

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 258

FOUR TENTHS, 850 DEG
LOAD STEP = 5.00000E+00 SUBCASE 40

D I S P L A C E M E N T V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	5.898267E-03	4.819513E-07	3.446976E-01	6.025681E-05	5.009273E-02	-2.227163E-06
2	G	9.105776E-03	1.845849E-02	4.048034E-01	-1.862778E-01	-2.386514E-02	1.249783E-02
3	G	1.174049E-02	2.214886E-02	4.017623E-01	-1.413231E-01	3.256787E-02	1.449489E-03
4	G	1.357910E-02	2.053461E-02	3.527125E-01	-1.079401E-01	1.166789E-01	-6.854097E-03
5	G	1.218533E-02	1.540226E-02	2.658411E-01	-6.742228E-02	1.113895E-01	-5.996456E-03
6	G	7.623834E-03	8.317149E-03	1.482080E-01	-9.295017E-02	2.669286E-01	-1.626639E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	7.955311E-03	1.640611E-02	3.846441E-01	-1.409201E-01	-4.318351E-02	1.541919E-02
9	G	1.025617E-02	1.985601E-02	3.710987E-01	-1.078797E-01	4.206750E-02	9.174506E-04

FIVE TENTHS, 850 DEG
LOAD STEP = 6.00000E+00 SUBCASE 50

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	6.807934E-03	6.537123E-07	3.705895E-01	8.751604E-05	6.667449E-02	-2.273295E-06
2	G	1.050580E-02	2.145305E-02	4.351756E-01	-2.024821E-01	-2.543410E-02	1.443324E-02
3	G	1.355930E-02	2.574685E-02	4.319682E-01	-1.532743E-01	3.444390E-02	1.764385E-03
4	G	1.568995E-02	2.387874E-02	3.792529E-01	-1.170205E-01	1.261368E-01	-8.045512E-03
5	G	1.407912E-02	1.792737E-02	2.858534E-01	-7.164693E-02	1.189678E-01	-6.911833E-03
6	G	8.843997E-03	9.716834E-03	1.596162E-01	-1.021624E-01	2.869564E-01	-1.907451E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	9.182462E-03	1.904195E-02	4.133443E-01	-1.521008E-01	-4.669637E-02	1.794184E-02
9	G	1.183164E-02	2.305176E-02	3.987711E-01	-1.163399E-01	4.531955E-02	1.064080E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 260

SIX TENTHS, 850 DEG
LOAD STEP = 7.00000E+00 SUBCASE 60

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	7.651977E-03	8.385808E-07	3.932865E-01	1.180031E-04	8.240986E-02	-1.982643E-06
2	G	1.180917E-02	2.424895E-02	4.617254E-01	-2.165228E-01	-2.679374E-02	1.624226E-02
3	G	1.525545E-02	2.910868E-02	4.583673E-01	-1.636536E-01	3.609486E-02	2.063758E-03
4	G	1.766079E-02	2.700536E-02	4.024516E-01	-1.249036E-01	1.343639E-01	-9.159934E-03
5	G	1.584858E-02	2.028933E-02	3.033482E-01	-7.533624E-02	1.256379E-01	-7.769627E-03
6	G	9.986255E-03	1.102781E-02	1.695873E-01	-1.102186E-01	3.043635E-01	-2.171361E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.032459E-02	2.150301E-02	4.384492E-01	-1.618092E-01	-4.969111E-02	2.029418E-02
9	G	1.330068E-02	2.603820E-02	4.229762E-01	-1.236710E-01	4.812279E-02	1.207627E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 261

SEVEN TENTHS, 850 DEG
LOAD STEP = 8.00000E+00 SUBCASE 70

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	8.444383E-03	1.035165E-06	4.136287E-01	1.513549E-04	9.736912E-02	-1.326176E-06
2	G	1.303675E-02	2.688907E-02	4.854603E-01	-2.289750E-01	-2.798601E-02	1.795065E-02
3	G	1.685544E-02	3.228557E-02	4.819636E-01	-1.728785E-01	3.757272E-02	2.351565E-03
4	G	1.952202E-02	2.996187E-02	4.231902E-01	-1.319081E-01	1.416893E-01	-1.021340E-02
5	G	1.752092E-02	2.252390E-02	3.189906E-01	-7.863822E-02	1.316321E-01	-8.582314E-03
6	G	1.106761E-02	1.226945E-02	1.785021E-01	-1.174355E-01	3.198478E-01	-2.422103E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.139991E-02	2.382736E-02	4.609060E-01	-1.704401E-01	-5.229882E-02	2.251120E-02
9	G	1.468634E-02	2.886103E-02	4.446275E-01	-1.301744E-01	5.059562E-02	1.349442E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 262

EIGHT TENTHS, 850 DEG
LOAD STEP = 9.00000E+00 SUBCASE 80

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.194567E-03	1.242418E-06	4.321500E-01	1.872956E-04	1.116249E-01	-2.821901E-07
2	G	1.420257E-02	2.940229E-02	5.070201E-01	-2.402029E-01	-2.904010E-02	1.957568E-02
3	G	1.837709E-02	3.531191E-02	5.033941E-01	-1.812128E-01	3.891205E-02	2.630493E-03
4	G	2.129404E-02	3.278008E-02	4.420284E-01	-1.382357E-01	1.483209E-01	-1.121689E-02
5	G	1.911439E-02	2.465502E-02	3.332028E-01	-8.164413E-02	1.370996E-01	-9.358269E-03
6	G	1.209946E-02	1.345478E-02	1.866016E-01	-1.240111E-01	3.338506E-01	-2.662186E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.242068E-02	2.604054E-02	4.813163E-01	-1.782419E-01	-5.460377E-02	2.461663E-02
9	G	1.600412E-02	3.155088E-02	4.643051E-01	-1.360403E-01	5.281332E-02	1.490320E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 263

NINE TENTHS, 850 DEG
LOAD STEP = 1.00000E+01 SUBCASE 90

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	9.909249E-03	1.459520E-06	4.492135E-01	2.256083E-04	1.252442E-01	1.166062E-06
2	G	1.531662E-02	3.180917E-02	5.268393E-01	-2.504533E-01	-2.997748E-02	2.112970E-02
3	G	1.983310E-02	3.822223E-02	5.230917E-01	-1.888350E-01	4.013733E-02	2.902442E-03
4	G	2.299140E-02	3.548266E-02	4.593459E-01	-1.440231E-01	1.543995E-01	-1.217831E-02
5	G	2.064195E-02	2.669975E-02	3.462709E-01	-8.441477E-02	1.421427E-01	-1.010346E-02
6	G	1.308994E-02	1.459308E-02	1.940493E-01	-1.300782E-01	3.466707E-01	-2.893395E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.339567E-02	2.816073E-02	5.000889E-01	-1.853822E-01	-5.666395E-02	2.662752E-02
9	G	1.726506E-02	3.412959E-02	4.824032E-01	-1.413977E-01	5.482716E-02	1.630748E-03

1 LARGE DISPLACEMENT ANALYSIS OF A CIRCULAR MEMBRANE AUGUST 4, 2000 MSC/NASTRAN 2/ 9/99 PAGE 264

ONE, 850 DEG
LOAD STEP = 1.10000E+01 SUBCASE 101

D I S P L A C E M E N T   V E C T O R

POINT ID.	TYPE	T1	T2	T3	R1	R2	R3
1	G	1.059351E-02	1.685783E-06	4.650811E-01	2.661124E-04	1.382880E-01	3.032111E-06
2	G	1.638644E-02	3.412526E-02	5.452314E-01	-2.599040E-01	-3.081485E-02	2.262212E-02
3	G	2.123303E-02	4.100503E-02	5.413686E-01	-1.958738E-01	4.126689E-02	3.168791E-03
4	G	2.462505E-02	3.808668E-02	4.754169E-01	-1.493690E-01	1.600262E-01	-1.310377E-02
5	G	2.211337E-02	2.867091E-02	3.584011E-01	-8.699342E-02	1.468356E-01	-1.082241E-02
6	G	1.404516E-02	1.569131E-02	2.009629E-01	-1.357319E-01	3.585230E-01	-3.117096E-02
7	G	0.0	0.0	0.0	0.0	0.0	0.0
8	G	1.433147E-02	3.020165E-02	5.175185E-01	-1.919812E-01	-5.852170E-02	2.855693E-02
9	G	1.847748E-02	3.661359E-02	4.992060E-01	-1.463390E-01	5.667415E-02	1.771015E-03

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